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VOLUME FOUR NUMBER SIX DOLLAR A YEAR

BETTER FRUIT

December 1909

PLANTING, PRUNING AND ORCHARD HEATING EDITION

THE "McINTOSH RED," THE APPLE THAT MADE THE BITTER ROOT VALLEY, MONTANA, FAMOUS

PUBLISHED BY
BETTER FRUIT PUBLISHING COMPANY
HOOD RIVER, OREGON

LYLE

Look at the Map!

KLICKITAT APPLE LAND

Across the Columbia River from Hood River. Platted in any size tracts from five acres up. Sold for cash or monthly installments of ten per cent down and two per cent per month

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JONATHANS NEWTOWNS

Prunes Peaches Pears Plums Apples

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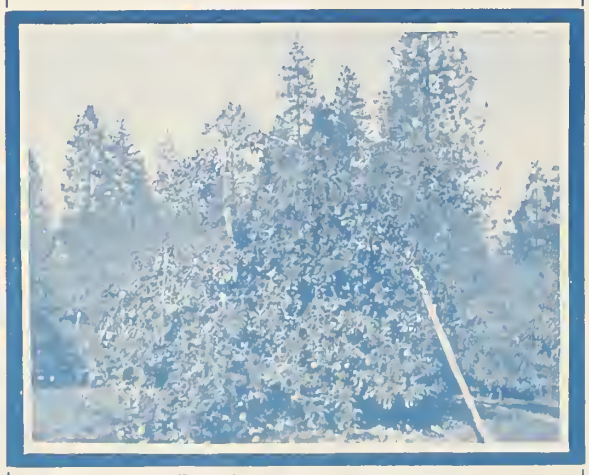

Berries Cherries Strawberries Nuts

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Located across the Columbia River from Hood River, Oregon, the White Salmon Valley offers the greatest opportunities of any land on earth to fruit growers. Where apples, cherries, pears, peaches, prunes and strawberries grow to perfection. A few dollars invested in fruit land today will return to you in a very few years sixty-fold. The soil, climate, water and scenery are unsurpassed by that of any country. Build a home where you can enjoy peace and plenty the remainder of your life. Fruit lands cleared, planted and cared for until in a bearing condition. Write us for descriptive matter and prices.

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Are you insured against frost? If not, our system of orchard heating assures you absolute protection from frost and a perfect insurance.

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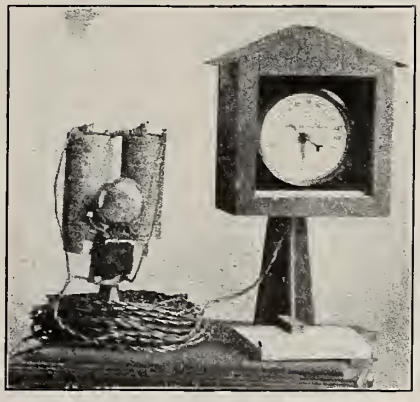

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We handle annually 1,500 Cars Fresh Green Fruits
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JUST OVER THE MOUNTAINS FROM OREGON IN A BEAUTIFUL CALIFORNIA VALLEY
YOU CAN PICK FRUIT EVERY MONTH IN THE YEAR

You can cut alfalfa six times and net $60 per acre. Two crops of potatoes and other vegetables give double the results obtained elsewhere. Our irrigated lands are selling fast at $150 per acre, with water right, on easy terms. No damaging frosts; cheap river and rail transportation; adjoining the Stanford University vineyard. The chance of a lifetime.

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Packers and shippers of the

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PLUMS, PEARS APPLES

Strawberries, Loganberries
Raspberries, Currants, Goosberries
Cherries, Etc., in Season

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ST. LOUIS

Is the best local market and distributing point to ship your apples, and hold on cold storage, for the highest winter prices.

Oregon, Washington and Idaho

Fruit Associations Growers and Shippers

I solicit your carload shipments of box apples this fall for cold storage here. **Will advance freights and pay insurance,** charging usual commission and interest.

Storage rates 15 cents per box for season ending May 1

Only Extra Fancy Fruit wanted

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We have modern cold storage facilities essential for the handling of your products

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Apples, Pears, Peaches, Cherries, Plums, Prunes, Apricots, Grapes and Cantaloupes

Mixed carloads start about July 20. Straight carloads in season. Our fruit is the very best grade; pack guaranteed

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THE HOME OF THE PERFECT JONATHAN

We are the owners of the prize-winning apple orchard of the United States, having won seven individual prizes out of a possible eight at the National Horticultural Congress at Council Bluffs, Iowa, December, 1908, against nineteen competing states.

Orchards in this famous fruit belt this year required thinning. (See our thinning scene elsewhere in this issue.) This apple belt never lost a crop by frost.

We are land dealers and own our offerings. Fruit lands and suburban tracts our specialties. Liberal terms.

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Our Plan: We plant, cultivate, irrigate and care for your orchard for four years, and pay your taxes for five years. You may remain at your present occupation while we bring your orchard to bearing. No charge for water. The largest private irrigation project in the West. Buy now, before a further increase in values. Easy terms. Send for literature.

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In Tracts to Suit

Rich soil. Delightful climate

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Cheap and the best of land. Plenty of water for irrigation at low rates. Good transportation facilities. You are cordially invited to see what I have done at my home in six years. I handle these lands.

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What Palisade is to Colorado

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Buy cheap lands now

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HOOD RIVER, OREGON

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CLIMATE—A desirable medium between the drier eastern and the more moist western conditions of the Northwest.

SOIL—Volcanic ash, rich in phosphates, and recognized as the best in the world for apples and strawberries.

Makes a specialty of real estate, conveyancing, loans and surveying. The president, John Leland Henderson, is a practicing lawyer residing in Hood River, and has been identified with the Hood River Valley for thirty-three years.

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Fruit Lands

Under the United States Government Conol in the heart of the

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Where the winter apple, staple as wheat in the world's markets, grows "all red," and in size, flavor and keeping qualities not excelled; where trees bear every year and injury from frost has never occurred; where the soil is deep and fertile, where the climate is equable, where drainage and health conditions are all that are desired, and where you will find the best of neighbors, with corresponding church, school and social advantages,

See or Write to

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The Willamette Valley

OREGON

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3500 ACRES

Now being sold in five, ten and twenty-acre tracts on liberal terms. Especially adapted to the successful production of Jonathan, Rome Beauty and McIntosh Red apples. The Baker Valley is to Oregon what the Bitter Root is to Montana and the Grand Valley to Colorado. Land only two miles from the second best city in Oregon. Prices far below what you are accustomed to.

Descriptive literature

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We will plant and care for an

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for you until it begins to bear—meantime you make small monthly payments

As the largest orchard operators in the Spokane country we invite you to become interested with us and in a way entirely within your means. I will gladly submit full data, price of tracts, terms, and other information of value upon request. Just request our booklet, "The Commercial Orchard," and say you want to know more. A postal will do.—A. G. Hanauer, Vice President.

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Feltham-Klotz Land Company

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For description and prices on choice irrigated fruit lands, orchards, stock ranches and timber lands

ALWAYS A FRUIT CROP IN

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With best of prices, scenery, climate, transportation, soil, mountain water, timber, etc. Send for our list of lands and literature

G. Y. EDWARDS & CO. Hood River, Oregon

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Of the Pacific Northwest

THE prejudice of fruit growers in favor of their particular districts is natural and admirable. It is not, however, conclusive evidence that some other valley or region is not equally good for the raising of fruit, for a home and for profits. **Painstaking investigation will demonstrate that the Bitter Root Valley offers at least one of the greatest opportunities today for the fruit grower or the intensive farmer.**

Some Convincing Reasons

Why the Bitter Root Valley Deserves Immediate Consideration

It has a most favorable elevation (from 3,300 to 3,600 feet).

It possesses unequaled mountain protection, and is thus absolutely free from codling moth and other deadly insect pests.

It is also immune from serious crop failures and from late spring frosts.

Its climate and altitude mean heavy bearing and long life to fruit trees.

It blesses the grower with maximum personal comfort, since it is free from violent winds, dust storms, and excessive extremes of heat or cold.

Its rich soils produce maximum crops of fruit and small fruit characterized by high flavor and color, as well as unusual quantity and quality in grains and vegetables.

It provides unequaled possibilities for diversified farming, with perpetual high markets in the surrounding unproductive districts, including Butte, Anaconda, Helena, and the regions immediately east of the Rocky Mountains.

It is completely surrounded, except for one narrow pass, by high, impressive and beautiful mountains, which provide at once protection, hunting, fishing and mountain recreations.

It is unrivaled in its healthfulness because of its ideal altitude, pure mountain air, and abundance of pure mountain water.

It is an ideal place for a home, and is being made more ideal by the coming of hundreds of prominent people from the Middle states and the East. There is nothing in the Northwest to parallel this movement.

AND FINALLY—Unprecedented opportunities are offered in abundance. The former isolation of the valley has left to this generation a flood of chances for home, independence and fortune. Where no capital has been invested until recently, millions of dollars (in irrigation projects, in railroads, in new towns and in every form of development) have been expended during the past two years,—and this movement has only begun.

THINGS ARE DIFFERENT IN THE BITTER ROOT

Do not forget, moreover, that the greatest irrigated fruit-land project in the world has just completed its irrigation system and now offers at comparatively low prices those opportunities which were years ago commonly to be found in Yakima, Hood River and Wenatchee Valleys.

This is the only great irrigation company that has ever developed its own lands on a large scale. Years of experience in orchard and irrigation problems, with an adequate management and abundant capital, guarantee the successful outcome of the company's orchard plans. Professor E. P. Sandsten, state horticulturist of Wisconsin, is in charge of the company's work, and his advice is offered gratis to purchasers and investors. There is also Professor R. W. Fisher, recently state horticulturist of Montana, and in addition the sub-horticultural experiment station on the company's land.

HERE IS AN UNPRECEDENTED OPPORTUNITY
FOR BOTH THE NON-RESIDENT INVESTOR AND THE PROSPECTIVE RESIDENT

For information of any kind address

BITTER ROOT VALLEY IRRIGATION COMPANY

Home Office
Hamilton, Montana

Eastern Office
100 Washington Street, Chicago, Illinois

White Salmon Valley

WASHINGTON

Across the river from Hood River Valley, Oregon, in the Banner Apple Belt of the World

The WHITE SALMON VALLEY today presents OPPORTUNITIES FOR INVESTMENT beyond that of any other FRUIT REGION in the Northwest. It is the north half of a LARGE VALLEY lying between Mount Adams on the north and Mount Hood on the south. The mighty Columbia flows between and divides this valley. From the Columbia River to Mount Hood forms the Hood River Valley, and from the Columbia River to Mount Adams forms the White Salmon Valley. Both these mountains are snowclad all the year and influence the climatic conditions. This, together with a volcanic ash soil, produces apples that are superior to all others in the world in FLAVOR, SIZE, COLOR, and, most important of all, KEEPING AND SHIPPING QUALITIES.

Ninety per cent of the fruit grown in this valley is exported, bringing the highest market prices.

THE CLIMATE of this region is ideal. It is located in the midst of the CASCADES, with a pure mountain air and free from excessive rains or drouth. The snow-covered peaks at either end of the valley temper the heat of summer and make the summer nights cool and invigorating. The winters are as a rule mild and short. The scenery is as fine as may be found anywhere on the continent.

The valley has been held back heretofore through lack of railroad transportation, but the SPOKANE, PORTLAND & SEATTLE RAILROAD, part of the Hill system, now in operation, gives this valley the best of shipping facilities.

NOW IS THE TIME TO SECURE A CHOICE ORCHARD TRACT AT A LOW FIGURE. Write today for particulars of this wonderful valley to the

WHITE SALMON VALLEY DEVELOPMENT LEAGUE White Salmon, Washington

ACRES 520 ACRES

Of Rich Orchard Land in One Body

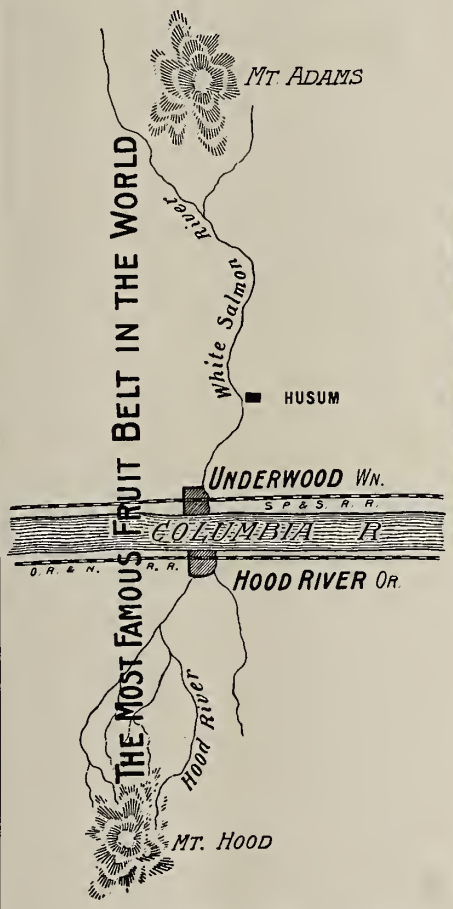
IN THE

White Salmon Valley

WASHINGTON

150 acres ready to set to trees, 200 acres easy to clear, 170 acres fine timber, *all first class fruit land*

For full Description, Price and Terms Address J. C. MacINNES, White Salmon, Wash.



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The Gateway to the White Salmon Valley

WHITE SALMON VALLEY FRUIT GROWERS' UNION OF UNDERWOOD, WASHINGTON, WON THREE IMPORTANT PREMIUMS AT SPOKANE
First on Best Four-Tier Newtowns, Second on Best Ten Boxes Newtowns, First on Best Pack

Twenty minutes from Hood River by ferry. Two hours by rail, seven hours by boat from Portland. Twenty-five thousand acres first-class fruit land tributary to this point. Has a strong Apple Growers' Union, which controls the output of the valley. Same fruit, same markets, same prices as Hood River has. Fine class of people coming in—a community of *homes*. Land close in to river and railroad $40.00 to $150.00 an acre *now*, but advancing rapidly.

Write, phone or call on

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Splendid Opportunity for a Good Investment

A chance of a lifetime to secure Ten Acres of Choice Apple Land at only $100 per acre

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ICS/VL—21 acres 2½ miles out on East Side; 7 acres 13-year-old trees; 400 6-year-old, 400 3-year-old and 200 1-year-old Spitzenbergs and Newtowns; 3 acres ready for trees; home orchard of peaches, pears, cherries, plums, etc.; 5-room house, barn, good well; 5 inches irrigating water; on main road; beautiful building site. Price $21,000.

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20 Acres Located five miles out in the center of the West Side, on main county road; nice location, fine soil, good drainage; 15 acres in 3-year-old commercial orchard, in good condition, consisting of 375 Newtowns, 600 Spitzenbergs, and 210 Arkansas Blacks, Jonathans and Wagners for pollenizers. Balance of place is in meadow. Five inches of water stock goes with place. Price $11,000; $3,000 cash.

22 Acres Unimproved, four miles southwest of Hood River on main county road; good clay soil, fine drainage, ideal location; three acres cleared and plowed, and the balance all slashed and burned; new two-room house on place. Price $350 per acre; $3,500 cash. This place will easily be worth $600 per acre when set to orchard.

20 Acres Five and one-half miles out, in the Oak Grove district; perfect soil, fine drainage, high and sightly; stream through place, which affords good fishing and free irrigating water; new seven-room house, hard finished, costing $1,750. There are 262 12-year-old apples, mostly Spitzenbergs; 90 4-year-old Spitzenbergs, 207 2-year-old Newtowns and Spitzenbergs, and a family assortment of peaches, pears, cherries, apricots, etc., all in prime condition; five acres of strawberries, mostly spring planting; half mile to school and store; R. F. D. and telephone. Price $13,500; $5,000 cash.

20 Acres Unimproved, about seven miles from Hood River on East Side; high and sightly; easily worked red shot soil; all good orchard land; under the ditch; some oak and pine timber. Price $150 per acre; easy terms.

Acres 9 All under cultivation, two and one-half miles southwest of Hood River, facing north on main county road; good drainage; easily worked clay soil; one mile to school and church. There are 160 Newtowns, 20 Arkansas Blacks and 20 Jonathans, all 1 year old, and 50 1-year-old peach trees as fillers. The place is all under cultivation and all under the ditch. Price $4,500; $2,000 cash, balance terms.

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BETTER FRUIT

A MONTHLY ILLUSTRATED MAGAZINE PUBLISHED IN THE INTEREST OF MODERN AND PROGRESSIVE FRUIT GROWING AND MARKETING

PRACTICAL IDEAS ON PRUNING OF FRUIT TREES

BY PROFESSOR W. S. THORNBER, PULLMAN, WASHINGTON

PRUNING is one of the most important yet least thoroughly understood crafts that is practiced by fruit growers. As a proof for this statement I suggest that any man who has attempted to grow a tree that shall combine all of the desired characteristics of an ideal fruit tree, make a careful count of the perfect trees ten years old, or older, in the average orchards of any district in the Northwest. After doing so he will be compelled to say that every one has weaknesses.

What is the Ideal Tree?—Many growers differ as to the minor characteristics, but practically all agree as to the general principles that should be observed.

First, a low-headed tree, because (a) we must be able to reach the highest branches with spray under high pressure. (b) Every branch must be thinned by hand. (c) In harvesting high-grade fruit each specimen must be picked, not clubbed from the tree.

Second, an open-topped tree, in order that the sun's rays may enter all parts of the crown and thoroughly color every specimen.

Third, a series of strong crotches and a framework of branches from the main trunk that will not become weaker as the tree grows older.

While these principles are exacting in some ways, they are very general in others, so general, in fact, that a tree may come into the class of perfect trees and yet have been trained under any one of the several different systems.

Every tree is a rule unto itself and no two trees can be pruned alike. A good pruner is quick to detect weaknesses as well as strong features in a variety or individual. He must be elastic in perception as well as application, or he will ruin many a valuable tree. His duty is to make the best of every individual, regardless of its condition or shape.

When to Prune.—There can be no best time to prune all ages and kinds of fruits under all kinds of conditions. The vigorous grower and shy bearer must not be compelled to fit into the same scheme and mould as the productive tree and tardy grower. As a general rule, heavy winter pruning tends toward the production of wood, while heavy summer pruning tends to fruit buds and fruit production. One excites wood growth and activity, while the other checks growth and hastens reproduction.

The essential thing in a young tree is that it make a strong, rapid growth, and so it should be pruned at a season of the year that will induce this growth. Under ordinary conditions this is during the winter, but since we occasionally get winter injury of the pruned ends it is best to prune after the heavy freezing weather is past. Personally, I would rather prune after the young trees have made from four to six inches of spring growth than during January or February.

When the young tree becomes large enough or old enough to bear fruit this heavy winter pruning may be partially or entirely supplanted in some sections by summer pruning.

The essential thing in a mature tree is that it produce fruit, and so it should be permitted, and even compelled, to bear fruit. It has failed in life if it does not. We have many fruit trees in the West serving only the purposes common to shade trees which by proper treatment could be made very productive of fine fruit.

Pears and apples should be treated very much alike when young, but the heavy winter pruning of the pear should stop as soon as it is large enough to begin to bear and only summer pruning be practiced as the trees grow older.

Sour cherries require little or no pruning after the trees have come to bearing size, while sweet cherries should be pruned lightly each year immediately after the crop is harvested. This can be of the nature of a summer pruning and should consist of the removal of diseased, broken and superfluous limbs, occasionally cutting back, but never so severely as to produce heavy growth.

How to Prune.—Pruning should be done thoughtfully and carefully with a sharp saw for large limbs, a pair of loppers for medium sized ones, a pole saw or pole pruner for high ones, and a knife or hand pruners for the small ones.

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Portland, Oregon, November 7, 1909.

Mr. E. H. Shepard, Publisher "Better Fruit," Hood River, Oregon.

My Dear Mr. Shepard: I have before me the November copy of "Better Fruit." The fruit growers of every section must certainly appreciate the value of your publication. We, the advertisers, fully appreciate the great benefit we receive, covering our advertisements in your publication. I sincerely trust that you are receiving sufficient encouragement to keep up the good work. The publicity derived from "Better Fruit" covers a wide territory and the great value of your advertising space is hard to estimate.

I have carefully read every publication of "Better Fruit" since the first number and perhaps I can appreciate as much as any one else the perfection reached in the November edition of 104 pages.

Am very glad, indeed, to give you our ad. in the December number. Use copy appearing in the November edition.

Covering advertising for the coming year, you can count on us, and I sincerely hope that we will be able to extend our advertising with you. You can rest assured that "Better Fruit" has no better friend than the Northern Pacific, for the simple reason that we obtain the best results from "Better Fruit" publication.

Yours truly,

A. D. CHARLTON,
A. G. P. A., N. P. R. R.

Note—Mr. Charlton has large orchard interests in the Yakima Valley.

"The ax is very good for splitting wood, but should never be permitted in the orchard."

In heading back young trees or topping last year's growth in old ones, the cut should be made slanting away from about one-sixteenth of an inch above the first bud that is intended to grow, as shown in Figure 1. A longer stub will dry, crack and form an entrance for bacteria, fungi, etc., while a shorter one will usually result in the death of the first bud.

In the removal of large branches from old or bearing trees always make the cut parallel with the branch or main stem from which the one is removed, and never at right angles to the part that is being removed (See Figure 2). This usually means a larger wound, but it will heal quicker and is less injurious to the tree than where the collar of the branch is left on the tree for the healing tissue to cover.

Do not hesitate to remove large, superfluous branches from a tree, but do it in a proper manner, and if necessary to prevent splitting or peeling of the bark

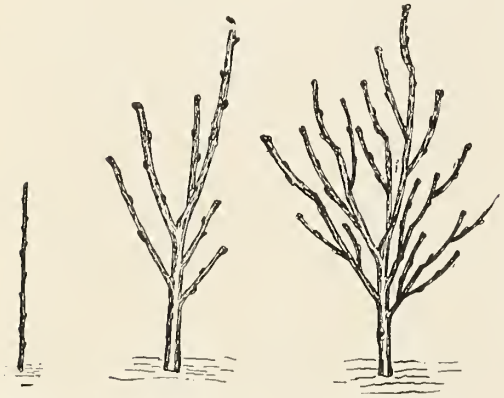


FIGURE 3 ONE-YEAR OLD — FIGURE 4 TWO-YEAR-OLD — FIGURE 5 THREE-YEAR-OLD

make two cuts, the first from six to twelve inches out from where the limb is to be finally cut off.

TWO-YEAR-OLD TREE, ONE-YEAR-OLD TOP

FORTY ACRES OF JONATHAN AND ROME BEAUTY APPLES
Owned by Dr. A. E. Miller, Austin, Colorado. A good example of pruning, the Jonathan being a difficult tree to shape up.

When pruning young trees that have a dense, upright habit of growth like the Wagener, Rome Beauty, etc., cut to strong outer buds in order to spread the naturally narrow, compact top, and when pruning spreading or slender growing trees cut to buds that point toward the center of the tree, in order to throw the limbs inward and upward.

In the removal of limbs from bearing trees always cut back to a limb and never leave a stub unless the top needs rejuvenating or thickening. By a little skill and care the tops of the high fruit trees can be opened up and very materially lowered by removing the uprights to horizontal branches.

Weak growing branches or trees may be compelled to produce strong growths by severe winter pruning, while strong, woody shoots may be compelled to become fruitful by timely summer pruning. Cut these shoots close. Do not leave them one or two inches long in hopes that they may by some mysterious power become fruit spurs, for by actual count less than five per cent ever develop buds and spurs. Branches cut back from four to six inches during the summer very frequently develop spurs along their sides.

Treatment of Wounds.—Nothing can be applied to a cut or wound on a tree that will hasten the healing. Wounds an inch or less in diameter need not be treated, while larger ones may be advantageously treated with a thick coat of lead paint. This should be applied a few days after the wound is made or just as soon as the surface has dried. Cheap mineral paint or tar should never be used, as it prevents healing by injuring the newly formed healing tissue. Grafting waxes usaully crack and peel before the wound has healed, but plastics and shellac are very good. Anything that will seal the wound and remain in contact is valuable.

Low headed trees have many advantages over high headed trees and with but few exceptions all fruit trees should be headed low. Two exceptions are common, namely, sweet cherries when used as shade trees, and prunes when grown for drying purposes. The prune tree naturally does not make a tall tree, so it

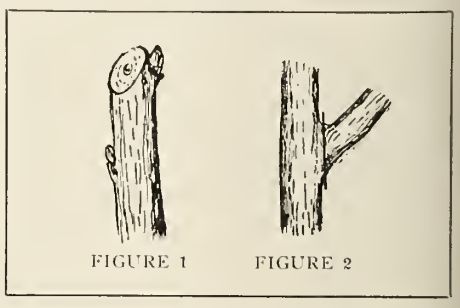


FIGURE 1 FIGURE 2

matters little how high it is pruned, but all other kinds of orchard fruits should be headed low, and long bare stems avoided so far as possible.

FOUR-YEAR-OLD TREE WITH THREE-YEAR-OLD TOP

A tree with more than eighteen inches of stem places its fruiting plane almost entirely out of reach of the average man from the ground. While the tree with much less than six inches of stem is apt to have trunk rot, and split readily under heavy loads of fruit.

One-year-old apples, pears and sweet cherries should be cut off at from eighteen to twenty-four inches from the ground, and one-year-old peaches and sour cherries at from ten to fifteen inches from the ground. This pruning, if strictly adherred to and done in the spring, produces uniformly low headed trees. If the yearlings are well branched a few of the limbs may be made use of; however, it is usually best to "spur" if not cut back to switches (Figure 3). Aside from this pruning, the young trees will require no further pruning until the following spring, unless strong sprouts spring from the base or below the first six to eight inches of the cherry, apple or pear stems. If the stems are slender, permit them to grow until August; otherwise, rub them off as fast as they appear. Peach sprouts, if from above the bud, may be permitted to grow.

In the second year select from three to five of the best placed limbs to become the framework of the tree, securing so far as possible limbs that point in all directions and those that are as far apart on the main stem. Cut off the others close to the main stem and prune the selected ones back to from one-third to one-half their original length, leaving the most central one from four to six inches longer than the rest to act as a leader upon which to build further framework for the center of the tree the coming year (Figure 4). None of these framework limbs should be more than eighteen inches in length. In the case of upright growers, prune to outer buds, while in the case of weak growers prune to inner or upper buds. In windy exposures turn as many limbs as possible in the face of the wind and try to leave a low lateral on the windward side.

In the third year select from two to three limbs per branch of the frame, remove diseased, broken and superfluous branches, and cut the selected ones back to from one-half to two-thirds of their original length. The leader should still be maintained and the top carefully balanced in order to form a well shaped tree (See Figure 5).

During the fourth and fifth years the limbs should be selected as for the third year, again removing diseased, crossing or superfluous branches. Cut back the remaining limbs and severely thin the top. Summer pruning may now be practiced to advantage in most sections and especially with pears, sweet cherries and tardy bearers of the apple group. From this time on strong, sappy growth should be discouraged in all varieties, but more especially in pears and sweet cherries.

Pruning is common sense put into practice. A young tree is as plastic as clay in the hands of a molder, but an old tree is established and can be mastered only by severe practices.

SUNCREST ORCHARD, MEDFORD, OREGON
Owned by Dr. Fred C. Page. Six-year-old trees. Note uniformity in shape of trees

A POOR WEAK FRAME
Two main branches, each sub-branched four times

A FIRST-CLASS, WELL-FORMED FRAME
Good for many years and large crops. No two branches opposite, and are well separated.

PRUNING SCENE, BEAR CREEK ORCHARD, MEDFORD, OREGON

◈ ◈ ◈

EASTERNERS LIKE DOUGLAS COUNTY

Roseburg, Oregon, October 28.—Senator E. L. Meyers, of St. Paul, Minnesota; W. E. St. John, of Hastings, Nebraska, and Howard Everett, of St. Paul, Minnesota, three members of the Luse Land and Development Company of St. Paul, accompanied by fifteen of their salesmen, were guests of the Roseburg Commercial Club last night. They are on a tour of inspection of their holdings in Douglas County, and arrived at Sutherlin Monday night. They will remain at Sutherlin until Friday. The personnel of the body is as follows: C. L. Dickey, Columbus, Nebraska; W. G. Davidson, Omaha, Nebraska; J. H. Galloway, Hastings, Nebraska; Brit Armick, Des Moines, Iowa; Barney Willet, Minneapolis, Minnesota; Charles Yager, Red Oak, Iowa; A. W. Palmer, Mount Pleasant, Iowa; H. W. Clark, Avoca, Iowa; J. C. Trainor, Carroll, Iowa; S. M. Shoffer, Muncie, Indiana; Madison Sorensen, Kinstallton, Iowa; Harold Hansen, St. Paul, Minnesota; A. L. West, Mason City, Iowa; R. S. Dewar, Gibson City, Illinois; Theodore L. Hoffman, Enterprise, Kansas. These men are well pleased with Oregon, and especially Douglas County, and are planning an excursion from the East here soon. They expect to bring three or four cars of people, who will locate in Douglas County.

THE PROPER PRUNING OF MATURE FRUIT TREES

BY PROFESSOR O. B. WHIPPLE, COLORADO AGRICULTURAL COLLEGE, FORT COLLINS

MANY and varied are the excuses offered by the man who owns an unpruned orchard; he is ashamed of the neglected trees and tries to justify himself by advancing what he considers, or more likely what he tries to persuade himself, is a good reason. One holds that pruning is little short of sacrilege, contrary to the laws of nature; another tells what excellent fruits he picked from the old apple tree, pruned alone by nature; another says it does not pay, and in his particular case it probably does not, for the chances are that the orchard is otherwise neglected. The man who cannot afford to prune cannot afford to grow fruit, and the man who does not know how to prune must learn; the principles are not complicated.

To be an intelligent pruner one must know something about plant physiology. He should know the effects produced by pruning at different seasons of the year, how to make a cut that will heal most readily, and the influence of pruning on the fruit-bearing habit of the tree. It may be said that the fruit grower prunes at his leisure, but luckily this conforms pretty closely to the proper season, when looked at from a physiological point of view. It is generally conceded that pruning during the dormant season incites wood growth, while pruning during the growing season promotes fruitfulness; and, since our trees tend to overbear, it is logical for us to prune largely during the dormant season.

Although it is said that pruning during the summer season may encourage the formation of fruit buds on tardy bearing varieties, it may have the opposite effect unless done at the proper time, and may cause late growth and unfruitfulness. To give the desired results one must summer-prune shortly before the season of growth ends; earlier pruning starts new growth, while late pruning gives no results. The benefit derived from summer pruning seems to depend upon the ability of the pruner to prune at a time to bring about early maturity. In an irrigated section where soil conditions are easily controlled, the same end may, no doubt, be more easily attained by proper manipulation of the irrigation water.

FIGURE 1—Exaggerated type of open head; waste of fruiting space in a Colorado apple tree.

FIGURE 2—Tree allowed to grow at will; ruined by a heavy crop of fruit. It was not overloaded, for it matured its crop, but the fruit was all near the tops of the long arms.

FIGURE 3—Jonathan tree well headed in and stocky. Such a system of pruning is necessary with the mature Jonathan.

FIGURE 4—A neglected Jonathan. The leaders are long and willowy and the tips are loaded with fruit spurs. The tops of these leaders develop small leaves and set a large crop of fruit, that rarely comes up to size. All these leaders should be cut back to strong laterals. This tree is a candidate for the same fate as Figure 2.

Both the season at which the wound is made and the character of the cut have an influence upon the healing process. The pruner should remember that all food material capable of healing a wound is taking a downward course through the inner bark, and that to heal well a wound must be in a position to intercept the downward flow of sap from the foliage higher up. When a limb is to be removed entirely, the cut should be at the union with and parallel to the surface from which the limb arises. Where limbs are to be headed back they should be cut to a side limb and not to a bare stub. Wounds naturally heal best when made at a season of the year when growth is most active, but with the possible exception of wounds made in early winter and subjected to a long season of drying, the season at which the wound is made has no important bearing upon the healing process. The grower who has a small orchard that will permit of such a practice should delay the pruning until as near the opening of the growing season as possible.

The influence of pruning upon the fruit-bearing habit of the tree has been briefly mentioned, but we will further show how a fruit-bearing habit may to a certain extent dictate a course in pruning. The fruits with which this discussion has to deal have two general types of fruit bearing: from terminal fruit buds and from axillary fruit buds. The first type of fruit bud is well repercsented in the apple and pear, and the latter in the stone fruits. Trees which produce axillary fruit buds are naturally more prolific and require severe pruning as a means of thinning the fruit. In fact, a system of pruning under which the tree with axillary fruit buds would thrive would cause the apple tree to overgrow to such an extent that it would be rendered almost barren. The point may be more fully illustrated by comparing the peach and the cherry. Although both develop axillary fruit buds, they differ in their fruiting habits; the fruit buds of the cherry are seldom found on the stronger growing new wood, and severe pruning, as practiced on the peach, would throw much of the strength of the tree into the production of strong wood that would carry very few fruit buds. We have said that in the apple the type of fruit-bearing is from terminal buds, yet, many varieties develop axillary fruit buds. Varieties which develop axillary fruit buds and bear terminal fruit buds on young spurs all tend to overbear, and require severe pruning.

The argument in favor of dressing wounds is that it prevents decay and

checks evaporation, both of which might interfere with the healing process. While in our arid climate the first is hardly applicable, the second should probably be doubly important. Yet, the matter of dressing wounds is not so important, but that work improperly done is worse than no treatment. A good lead paint is one of the most satisfactory dressings yet found. Rather a thick paint should be used, and careless daubing of the surrounding bark should be avoided. Grafting wax is a good dressing, but is rather expensive and difficult to apply. Other materials have been used, some successfully and some disastrously, and the grower is to be cautioned about experimenting; better stick to materials known to be safe and efficient. Growers often overdo the matter and waste time treating small wounds. Surely a wound less than one and one-half inches in diameter is not worth bothering with.

These suggestions apply to wounds made by the careless cultivator, as well as those made by the pruner. Unsightly wounds and permanent injury may often be avoided by proper treatment of trunk wounds. When the body of the tree is injured the ragged edges of the bark should be pared off to sound tissue and the whole injury covered with paint or grafting wax. If promptly done, this prevents drying out of the tissues, and new bark will readily form, except on parts where the outer wood cells are actually destroyed, and in time this will grow over. Wrapping the injury with cloth, or if it is near the ground, mounding earth up over it will often answer the same purpose.

Every pruner should be furnished with good tools; good tools encourage him to do good work. This does not necessarily mean that he must have every tool on the market, many of them are useless; it does mean, however, that the axe and a dull saw have no place in the catalogue of pruning tools. The pruner needs a good saw, a good pair of light shears, a pair of heavy shears, possibly a good heavy knife and, of course, a good ladder. Two common types of saws are found on the market. The common saw with teeth on both edges is a good, cheap one and will answer the purpose in many cases. The various makes of the swivel saws are much handier, however. The blade is stretched between swivels and can be turned to any angle with reference to the frame. It is well adapted to close work in the crotches of the tree. This type of saw can generally be bought for three dollars. The blades are not so frail as they look and seldom break, if properly handled; they can be replaced at a cost of fifty cents. It is really the best type of pruning saw and should be more universally used.

A good type of hand shears is indispensable for light work. Various makes are on the market; buy the one that appeals to you. A pair of heavy shears is almost as essential; they take the place of the saw in many cases and will do the work in less time. They are used in heading in limbs where the saw can hardly be used; the peach pruner finds good use for them. They work well on limbs up to one and one-half inches in diameter. The only objection the writer has to this tool is that the pruner sometimes gets careless and leaves stubs. There is a type of heavy shears on the market that has two cutting edges instead of one, but it seems to do no better work. The pruner finds very little use for a knife in pruning mature trees and seldom carries a special pruning knife. Several types of the long-handled tree-pruners are on the market, but they are of little value in the orchard. The pruner should be close to his work, and with a good ladder and short-handled tools he will do better work.

FIGURE 5—Five-year-old Elberta peach tree; almost perfect. This tree should not be allowed to grow much higher.

FIGURE 6—Four-year-old Elberta; good form. Has made a good growth, with fruit wood near the bottom as well as in the top.

FIGURE 7—The same as Figure 6 after pruning. Plenty of fruiting wood still left and a good framework for a productive tree. In about one more season it will have reached the limit of height. It will broaden out a little yet if it is properly pruned in the top.

The Apple.—With the young orchard well grown, the pruner has probably solved the most difficult problem in the pruning of the apple orchard; the principles involved in the pruning of the old orchard are not complicated. Nearly all of our standard commercial varieties of apple tend to overbear, and one of the first objects of the pruner should be to overcome this tendency; the more prolific the variety the heavier the pruning. To be an intelligent pruner one must also acquaint himself with the habits of growth of the different varieties, as well as habits of fruit bearing. Upright-growers will require pruning to spread them, and straggling-growers such heading in as will make them grow more upright. The head should be kept reasonably open and well supplied with fruiting wood throughout. The idea of the open head, however, can be overdone. (Figure 1.) Limbs that interfere or are liable to form bad crotches should be removed and the main branches headed in as the tree indicates the need by overbearing or by weak growth. Moderate annual prunings are always to be preferred to heavy pruning at irregular intervals; these heavy prunings tend to upset a regular bearing habit and may bring on an "off-year." However, if it should become necessary to employ drastic measures in pruning the neglected orchard, do not be afraid to do it, but do not make the mistake of selecting an "off-year" in which to do the heavy pruning.

A discussion of the amount of pruning required by different varieties could almost as well be introduced as those on the pruning of different kinds of trees. Yet, the growth of the tree, and

necessarily the pruning, depends much upon soil conditions; and, while it might be possible, it would hardly be safe to lay down definite rules for the pruning of any particular variety. Both the Winesap and Missouri (Pippin) may be classed as prolific varieties that require severe pruning. The Jonathan, at the age of eleven or twelve years, almost invariably begins to grow spindling in the top and requires frequent cutting back to keep the tree in a thrifty condition. Figure 3 shows a Jonathan tree well headed-in, with stocky growth, while Figure 4 is of a neglected tree of the same variety, of the same age. These willowy limbs bear small leaves and an abundance of apples that rarely come up to size, and the liability of such neglected trees breaking down under a load of fruit is well shown in Figure 2. Figure 3 shows how sprouts are largely avoided by cutting to side limbs. Varieties that bloom heavily but set very few fruits should be treated as varieties that overbear; prune them heavily during the dormant season. Varieties that refuse to develop fruit buds should not be pruned excessively, during the dormant season at least. Summer pruning is supposed to incite fruitfulness, but does not always give uniform and satisfactory results. Such varieties may be forced to fruit more easily by withholding water in midsummer, or better still, plant them on a light soil; poor bearers are nearly always strong growers, and very often a shy bearer on heavy soil is prolific on a gravelly hillside. The Yellow Newtown is a striking example of a variety of this type. The growth and fruiting habit of the tree, we will see determine largely what treatment it shall receive at the hand of the pruner. While pruning may not take the place of thinning entirely it may be employed as a means of correcting the faults of alternate bearing and overbearing.

FIGURE 8—Seven-year-old peach tree getting too high. Notice how the fruiting wood is being smothered out below. About two more years of such pruning and it will be like the tree shown in Figure 11. Severe pruning in the top will yet save such a tree without cutting down the yield in any one season. This tree has been spoiled largely because the pruner did not have the room to properly spread it.

FIGURE 9—Type of tree similar to that in Figure 8, showing about how such a tree should be pruned. Could have been cut back a little more severely in the top to force more new wood below.

FIGURE 10—Eight-year-old peach tree that has been well pruned and trained. Notice how well the fruiting wood is distributed throughout the head. See how nearly it conforms to a right angle; an ideal shaped tree. The heavy pruning in the top indicates that the pruner does not intend to let it grow away from him. This tree good for seven more years at least.

FIGURE 11—Tree of the same age as that shown in Figure 10. Pruner has tried to increase the bearing surface by increasing the height of the tree, and notice the result. A tall, leggy tree with no fruiting wood below. This tree would be a good subject for a system of pruning similar to that shown in Figure 12.

Pruning the Apricot.—In the general growth and fruiting habit of the tree the apricot occupies a position between the cherry and the peach. The fruit buds are developed in the axils of leaves on both shortened spur-like twigs and the stronger growing new wood. These fruiting spurs of the apricot differ from those of the cherry in that they develop no true terminal buds. The apparent terminal of the new growth is a lateral bud and may be either a fruit bud or a branch bud. It is generally a branch bud, but it is not uncommon to find weak spurs bearing only fruit buds, and such spurs, with no branch bud to continue their growth, must perish at the close of the fruiting season.

The general plan of pruning the apricot will resemble that followed in pruning the peach, although, as a rule, it should be hardly as severe. The young tree is a strong grower and must be put through about the same course of training as the young peach. This strengthens or stiffens the frame work and develops a broad, low-headed tree. Normally, the tree does not grow as much new wood as the peach, and it is often possible to do the majority of pruning by simply heading in the strong growth. The pruning should be sufficient to keep the fruiting wood growing thriftily and the tree well within bounds. While to a certain extent pruning reduces the labor of hand thinning, it will not take its place entirely. If properly thinned, the apricot will stand much neglect as regards pruning, but proper pruning is a matter of economy. As the tree grows older it will need more severe pruning to force new fruiting wood in the center. The absence of fruiting wood in the center of the carelessly pruned apricot tree is even more pronounced than in the neglected peach tree. The top should be well spread and the fruiting area of the head maintained near the ground.

While the season for pruning the apricot in Colorado generally extends through February and March, summer pruning is quite extensively practiced on the Pacific Coast, where the trees are headed in as soon as the crop is harvested. This starts the smaller laterals into stronger growth and they develop an abundance of fruit buds. Observations of the same system employed in our climate suggests that it may not be without merit here. While this late growth is inclined to be immature and may suffer from severe winter freezing, it is more desirable from the standpoint of late blooming. Fruit buds on this immature wood open from four to five days later than those on mature wood. This may frequently be an advantage in localities where late spring

frosts are not uncommon. The advisability of such a practice has not been fully demonstrated and is given only as a suggestion.

The Cherry.—The man who objects to pruning, vowing homage to nature, should grow cherries, for there is no fruit tree of which it may be said that nature is a more efficient pruner. In fact, it is a common impression among fruit growers that the mature cherry tree needs no pruning. This condition of affairs, however, is more largely due to indifference on the part of the markets than to an inability to get results from pruning. When competition becomes more keen, fancy grades of cherries will gain in popularity and, as in the growing of other fancy fruits, pruning will be found expedient.

With the cherry the fruit is borne on one-year-old wood, and mostly on short growths, or spurs. An examination of the spurs will show that they differ from those of the apple in that they carry both terminal and axillary buds, the terminal, with few exceptions, being a branch bud, and those developed in the axils of the leaves mostly fruit buds. Fruit buds are also found as axillary buds near the base of the stronger growing new wood. The cherry, then, has a fruiting habit which would indicate that the tree will stand only moderate pruning. Trees over-pruned produce an excess of strong, new wood with few fruit buds. In neglected trees the spurs become weak and spindling from constant bearing; the flowers are borne singly in the buds, when they should be in pairs or triplets, and the tree produces a large number of medium-sized fruits.

The manner of pruning will depend somewhat on the variety, but the general plan should be to keep the fruiting area of the tree as near the ground as possible; to shade the trunk, to prevent sunscald, and to encourage the growth of fruiting wood throughout the entire top. The sweet and semi-sweet varities are upright growers and will need some heading in to keep them within bounds. The rapid growth forced by pruning must be checked by careful watering. Unless this precaution is heeded immature growth will result and. young trees especially, may be killed outright during severe winters. Like the Anjou pear, some of the cherries produce an excess of weak fruit buds that fail to set fruit. When this is found to be the case, it is a good sign that the tree is not being pruned as severely as it should be. Heavy pruning during the dormant season will often correct the fault. On the contrary, lack of bloom is generally due to excessive pruning or over-watering. Occasionally we find a variety where this fault is characteristic, but it may generally be overcome by proper handling.

Pruning the Peach.—There is probably no fruit tree that gives the careful, observing pruner as much pleasure in pruning as does the peach. Results soon indicate whether the pruning is right or wrong, for no fruit tree will suffer more from neglect, and none respond more promptly to careful treatment. This prompt response, so plainly indicated, lends not a little inspiration toward the proper training and care of the peach orchard, and it is safe to say that, largely on this account, no fruit tree is better pruned than is the peach in our recognized peach sections. The practice is simple, and lack of courage is more often responsible for failure rather than complicated principles. As mentioned before, the peach develops its fruit buds in the axils of the leaves, and the fruit is borne on one-year-old wood; a system of fruit bearing that makes severe pruning a prerequisite to successful peach growing.

In pruning the peach the object of the pruner should be to cut out enough wood to force good, strong growth each year; to remove superfluous fruiting wood, and to give the tree the desired shape. The mature peach tree should make an annual growth of at least eighteen inches. With such new growth much of the new wood will have to be removed entirely, while that remaining may be cut back to remove a part of the fruit buds it carries. While some object to shortening-in the fruiting wood, contending that it injures the fruit, the years of experience of our most careful growers recommended rather than condemn such a system of thinning. While it does not take the place of hand-thinning entirely, it does save a great deal of tedious hand work. It is hard to say just how much of the new wood is to be removed or how much the remainder should be shortened in. Probably four-fifths is removed entirely, the amount removed from that remaining depending more upon the location of the fruit buds. With the older tree it may be half or even more, while in the case of the young tree it may be necessary to leave the laterals unpruned, because

Figure 12—Peach tree severely cut back for the purpose of forming a new top. Some of these stubs will die back, but the tree will form a good new top. It would have been hardly safe to cut to stubs of this size had it not been for the smaller wood below.

Figure 13—New top two years old on an eleven-year-old peach tree. Such a new top is well worth the loss of one crop of fruit.

Figure 14—Pear tree improperly headed in. It is only reasonable to suppose that leaving large stubs with numerous fruit spurs bearing branch buds would result in a large number of sprouts. Heading in will, of course, always start some sprouts, but their number may be greatly lessened by cutting back the leader to side branches.

Figure 15—Same tree as shown in Figure 14, one year later. It tells the whole story.

A BEGINNER CAN MAKE A GOOD LIVING BY GROWING SMALL FRUIT BETWEEN THE ROWS OF TREES BEFORE TREES GET INTO BEARING

of the fruit buds being nearer the tips. Figure 6 shows a four-year-old Elberta that has made a very satisfactory growth. Figure 7 shows the same tree well pruned. From now on this tree must be carefully watched to keep it within bounds. As the framework stiffens the tree may be spread a little more, but it should not be allowed to go much higher. It is a common practice to do the heavier pruning earlier in the spring, leaving the clipping back and thinning of the new wood until later, some waiting until all danger of frost is past. The pruner should constantly keep before him an ideal form for the peach tree, the well grown young orchard, at the mercy of a careless pruner, may become ungainly and unproductive at the age of ten years. Effort should be made to keep the fruit as near the ground as possible; most of the fruit on a five-year-old tree should be reached from the ground, and in no peach orchard should the picker need a ladder longer than six feet. (See Figure 5.) The depth of the fruiting area of the peach tree will seldom exceed six or seven feet, and an attempt to increase this depth only results in a smothering out of the wood below. Figure 8 shows a seven-year-old tree that is really getting too high. Note the scarcity of fruiting wood in the lower part of the tree. This tree may be forced to develop new wood below if the top is well cut back. Figure 9 shows about how this type of tree should be pruned. This tree could have still been pruned a little heavier in the top. A better plan is to increase the productiveness of the tree by increasing its spread, rather than its height. The ideal peach tree is one in which the top just comes within a right angle or, in other words, the spread should be almost double the height. Figure 10 illustrates the point very well. Notice how the head is well filled with fruiting wood, and compare with Figure 11, a tree of the same age. With such a system of training the first tree will be productive at the age of fifteen years, while the latter, now ten years old, must be rejuvenated by severe heading in or be discarded as unprofitable. There is no fault to which the old peach tree

E. REMY'S APPLE ORCHARD IN FULL BLOOM, NORTH YAKIMA, WASHINGTON

SHOWING IRRIGATION OF AN ORCHARD IN WENATCHEE, WASHINGTON

more often falls heir than that of the absence of fruiting wood in its lower parts. Such wood below can only be maintained by vigorous pruning in the top. The center should also be well filled with fruiting wood, as space may be unnecessarily wasted by training the top too open; the open center is not a necessity in our arid sections where we enjoy an abundance of sunshine. The fruiting wood in the center of the tree will hardly appear as strong as that nearer the tips, but, nevertheless, some of our best fruit comes from short and apparently weak spurs along the larger limbs. Some have tried summer pruning (thinning out the new wood in the center of the tree), hoping to strengthen the wood remaining, but it has not given satisfactory results; too often it starts new growth that is immature and not fruitful.

It is seldom that we read a paper upon the subject of pruning the peach orchard without we see some reference to the treatment of winter-injured trees. With the exception of young trees grown too late, or orchards in higher altitudes or Northern latitudes, such injury is not often experienced in Colorado. It is well for the grower to remember, however, that the winter-injured peach tree makes the best recovery when it has received a moderately severe pruning. Another subject more worthy of mention is that of the rejuvenation of the old peach orchard. The occasional loss of a peach crop by late frosts offers an excellent opportunity to grow a new top on the old peach tree. Figure 12 shows a peach tree headed-in to secure a new top, while Figure 13 shows a tree eleven years old, two years after such a prun-

IN A BEARING ORCHARD AT WEISER, IDAHO

ing. The cutting back should be done as soon as possible after the loss of the crop can be ascertained; severe pruning as late as the first of June forces rank new growth that develops very few fruit buds. Rather large limbs may be cut if the bottom of the tree has some smaller growth, but cutting to bare stubs over two or three inches in diameter is hardly advisable.

The Pear.—The mature pear tree is not one that requires a great deal of pruning, nor does it allow lack of pruning to interfere seriously with its proper behavior, so far as fruit bearing is concerned. However, when the market demands that the fancy pear be from two and one-fourth to three and one-fourth inches in diameter, the owner of the old pear orchard is often reminded that the trees need pruning. In general, the manner of fruitbearing of the pear is practically identical with that of the apple. The spurs are a little shorter and give the tree rather a more barren appearance; and, although some varieties develop axillary fruit buds quite freely, the majority of the fruit buds are terminal on these short spurs. The different varieties vary somewhat in their fruiting habits, and a study of this character will, to a certain extent, indicate how much pruning each will require.

IN THE SHADE OF THE OLD APPLE TREE
Press representatives with the Southern Oregon demonstration train at Merlin, Oregon, March 25, 1909. This apple tree is now fifty-six years old and still bears fruit. Planted in 1853 by the Haines family, who were later massacred by the Indians.

Apparently the grower accepts the upright-growing habit of the pear as the inevitable, with hardly so much as an effort to train it otherwise. With proper training there is no reason why the pear tree may not be grown with a moderately broad and low head. Pears that grow in the tops of high trees are too often scarred, if not whipped off by the wind, before they are mature and, besides, it is too expensive to pick them. The forming of the tree belongs more to the province of pruning the young tree; but a little judicious heading-in practiced on the old tree, taking care to cut to outside buds or branches, will improve on an undesirable form. Too often the tree is allowed to grow at will until it is out of reach, and then, in a fit of desperation, the grower resorts to a system of heading-in. This system may be all right for the lawn hedge, but it is not well adapted to the pear. By the time the pruner gets through with this tree he will have decided that it is poor policy to head-in pear trees. Had the pear tree been properly headed-in from the beginning, the result would have been different. It is only reasonable to suppose that leaving stubs of large limbs which bear numerous fruit spurs will result in rank growth from these spurs, especially during an "off-year," when the spurs carry a large proportion of branch buds. When it becomes necessary to head-in the large pear trees, always cut to side limbs and do not make the mistake of choosing an "off-year" to do this severe pruning; a heavy crop tends to check rampant growth encouraged by rigorous pruning.

While some growers really believe that the pear tree will not stand pruning, we know of no variety to which moderate pruning is detrimental. On the other hand, there are varieties which require severe pruning. In spite of the fact that the Anjou pear is a favorite on the market, many growers will not consider the planting of this variety. Yet a few of its more forbearing admirers have demonstrated that its one bad fault (tardy bearing) may be overcome by proper pruning. The young tree blooms freely and apparently sets very well, but before the fruits reach any size the crop thins itself to almost nothing; even the old tree carries a very small proportion of its bloom to maturity. Heavy pruning during the dormant season will stop this shedding and insure a good crop of fruit. The practice of the most successful growers is to cut the tree back each year and remove some of the new wood that may have been forced by the last pruning. When once the tree begins to bear good crops, there is less trouble about its shedding. Some other varieties are more tardy about blooming, and heavy pruning during the dormant season would only augment this objectionable character. Such varieties often respond to June pruning; and, if they do not, girdling in June will often prove beneficial. In girdling, a strip of bark one-quarter of an inch in width and extending entirely around the trunk, may be

COZY NOOK AT GREENACRES, WASHINGTON, IN THE SPOKANE VALLEY

DEWBERRIES AT GREENACRES, SPOKANE VALLEY WASHINGTON

removed; but perhaps a safer plan is to remove vertical strips of bark one and one-half inches in width, leaving other strips of about the same width intact. If the wood is uninjured these wounds soon heal and do not permanently injure the tree.

It is difficult to say just how much the pear should be pruned; the grower will have to decide that for himself. The main object of pruning the mature tree should be to thin the fruit and thus improve the quality, as well as to encourage more regular bearing. However, the grower must not feel that pruning will take the place of thinning entirely; to get the best results the two must go together.

The subject of pruning the pear could hardly be considered complete without some reference to the control of pear blight. While it is true that when once the pear tree is inoculated with blight, we must lay aside many of our ideas about pruning and cut to remove the affected parts, it is also true that, in a way, the tree may be trained to reduce to a minimum the loss from attacks of this disease. After the tree begins to bear, heavy pruning which may induce rampant growth should be avoided, if possible, as it is generally conceded that blight is more destructive to trees making rank growth. The majority of inoculations take place through the blossoms, and one of the most serious types of injury is that occasioned by the entrance of blight into larger limbs through short spurs. Through these short spurs the germs gain entrance to the larger limbs and often girdle them before discoloration indicates their presence. It is the nature of the pear tree to develop these short spurs in abundance, and it will be necessary to remove them from the base of the larger limbs. Strong, new wood may be allowed to take their places, which may later be developed into fruiting branches. Then should blight enter these blossoms, they are far enough removed from the main limbs that the disease may be detected and intercepted before it reaches them.

Pruning the Plum.—Under this head is grouped a large number of species and varieties of fruit differing widely in their habits of growth and of fruit bearing. Were it not for the fact that common practice seems to discourage the pruning of many varieties to any considerable extent, this would be a difficult subject to handle; no well defined system of pruning would suit all. In their habits of fruit bearing the majority of the plums resemble the apricot very much. Still many of them, like the cherry, show more of an inclination to bear only branch buds on the thriftier new wood. Like the apricot, the plums, with possibly a few exceptions, develop no true terminal buds. Except on weak spurs, the last axillary bud is generally a branch bud which continues the growth of the branch or spur the following season. The fruit buds are developed in the axils of the leaves on both spurs and the ranker growing new wood, the different varieties showing considerable variation in this respect.

The body of the plum tree is subject to injury from sun-scald, and it goes without saying that the tree should be headed low. The young trees of most varieties will need cutting back, and the tops thinning out, to develop them into desirable shaped trees. Some varieties will require pruning to spread them, and others of a more straggling habit, will need cutting back to inside buds or branches to make them grow more upright. As mentioned before, the bearing plum tree, according to local custom, receives at most only moderate pruning. As a rule, the Domestica plums, locally represented by the various prunes, are pruned very little after they reach the bearing age. There are certain varieties which tend to overbear, however, and a certain amount of thinning out of the fruiting wood would greatly facilitate hand-thinning, promote more regular bearing, and improve the quality of the fruit. The pruning of the native plums is left largely to nature, although there is no reason why moderate pruning might not improve the quality of the fruit and lessen the difficulty of picking. There is little doubt but that such varieties as the Burbank, Abundance, Satsuma, Red June, and others of the Japanese group, respond satisfactorily to rather severe pruning. In fact, they are more like the apricot in their fruiting habit and thrive under the same system of pruning. When neglected they tend to overbear alternate years. They should receive an annual heading-in and thinning out to force strong, new growth, which makes very desirable fruiting wood. While pruning as a means of thinning the fruit is not without merit in the case of the plums, it does not seem to give results comparable with those obtained in pruning the peach. The grower of fancy plums must supplement moderate pruning with hand-thinning.

PUBLIC SCHOOL COURSE IN HORTICULTURE AT WENATCHEE, WASHINGTON
Students at work grafting in M. Horan's orchard

BLACKBERRY FIELD OF W. H. PAULHAMUS, SUMNER, WASHINGTON
Showing method employed first winter after planting

THE SETTING AND THINNING OUT OF ORCHARDS

BY R. W. ALLEN, FARM SUPERINTENDENT, UMATILLA EXPERIMENTAL FARM, HERMISTON, OREGON

THE need of careful planning and locating such permanent structures as buildings, bridges, etc., is questioned by no one, but the number of people is quite small who realize the importance of establishing an orchard with equally as much care.

The different plans of setting trees, as well as the distance at which they stand from each other, has considerable to do with the convenience and ease of carrying on the orchard operations. Where the rows run at right angles the number is less than in diagonal plantings, they are all of even length, and the cultivating is accomplished with a minimum of turning and without the need of finishing up the corners, as is necessary where diagonal rows exist.

In every part of the country orchard trees are to be found crowded so closely together that the branches interlock while they are still young and small. This condition is quite prevalent in all old orchards, and the same future is being thrust upon many young orchards by the same error in planting. It is natural that we should wish to get the maximum of returns from each acre of land, so it is that many people are influenced to set a greater number of trees on a limited area, expecting to profit by a corresponding increase in yield. This may be accomplished to a certain extent, and for a limited period of time, but the ultimate outcome is a probable exhaustion of the soil, and an unavoidable crowding of the roots and the branches, which makes cultivating, spraying and other work more difficult. When trees are crowded in this manner they are unable to get the required amount of nourishment, the proper distribution of light and air is often hindered, and a consequent deficiency in tree growth, yield and color of fruit is the result. The life of an orchard is shortened by its members being forced into competition for a sufficient amount of food and space for proper growth.

FIGURE II—SHOWING AMPLE ROOM FOR WORK

When ample room is allowed the trees develop normally, are strong and vigorous, produce fruit through a much greater period of time, and by virtue of their hardiness, are more immune from the ravages of insects and fungous diseases.

When trees become crowded the most effective remedy is to thin the orchard by taking out part of them in a systematic manner. The results that can be gotten in this work depend upon the distance between the trees, and the system by which they were set.

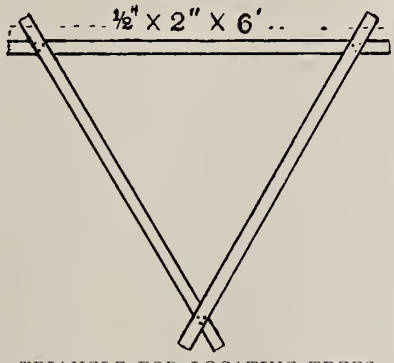
The square, or rectangular system can be thinned indefinitely, the first operation being to take out every alternate tree in each row, beginning with the first tree in the odd numbered and the second tree in the even numbered rows. There is left a series of somewhat larger squares running diagonally across the field, or the quincunx system with the corner trees in each square twice the distance apart they were before. If needed, it can be again thinned by proceeding the same as for thinning the quincunx system.

The quincunx system, which is essentially a series of squares with a tree in the center of each, is first thinned by removing every alternate row parallel with one side, leaving the trees in rectangles with the same dimensions. This system permits the placing of a great many more trees to the acre than by the rectangular. The number ranges from 45 per cent more in small orchards, to 98 per cent in orchards of 10,000 trees. When the odd and even numbered rows, parallel to the sides of the orchard, contain the same number of trees, i. e., when the rows of trees forming the sides of the squares and those standing in the centers of these figures have an equal number of trees, this system places 100 per cent more on a given area, no matter what size it is.

These two systems can be thinned with a fair degree of success when set at almost any distance. An orchard set 18 feet square, when properly thinned, leaves the trees 36 feet quincunx, or in squares 25.4 by 25.4 feet, running diagonally across the field; 22 feet square, thinned, equals 44 feet quincunx, 50 per cent of the trees being removed. The quincunx system thinned, when 18 feet apart equals 18 feet square; 22 feet thinned equals 22 feet square, etc. In this operation from 45 to 98 per cent of the trees are removed, depending upon the size of the orchard.

The matter of thinning a hexagonal orchard is much more difficult, if it was not planted with a view to future thin-

TREES SET TOO CLOSE



TRIANGLE FOR LOCATING TREES

ning, for it can only be done in one way to leave the trees in systematic order. To take out every other tree in each row, or each laternate row of trees, the remaining ones are left in unsystematic condition; but to take out every other row, and the alternate tree in the remaining rows, beginning with the second tree in the first row and first tree in the second row, thus removing 75 per cent of the trees, the hexagon is again established with twice the former distance between the trees.

From the fact that this system distributes the trees evenly over the ground and allows approximately 15 per cent more to be set to the acre than by the rectangular system, when placed at the same distance apart, it has become quite popular. A large percentage of the planting for the past few years has been by this system, and of these, the greater number of trees stand from twenty to twenty-six feet apart. In orchards set that close, thinning will need to be resorted to in time, and when it is properly done the remaining trees will be from forty to fifty-two feet apart. Each grower in whose orchard this condition exists is almost certain to let the trees stand crowded together until their vitality is impaired, for upon taking out the 75 per cent that must be removed to leave the remainder in systematic order he will approach the opposite extreme of having the number so diminished as to make the returns unprofitable for a period of years.

When sufficient room is given in the planting that thinning will never be required, or where early maturing or short-lived trees (fillers) are set in among the permanent ones, this system is a very desirable one. Where fillers are used they will compose 75 per cent of the trees required to set a given area, and are put in, one tree between two of the others in every direction, thus forming a great number of small hexagonal figures.

To lay out a field and plant the trees in straight rows requires careful and painstaking work. Some people prefer a transit to run lines with, but very accurate work can be done by aligning stakes with the eye, and by the use of measuring devices. A base line should first be established along one side of the tract to be planted, and the work extended from this. Pegs should be placed on this line in position for the first row of trees, and by the use of accurately made triangles of wire or other light and durable material, with one or more sides equal to the distance required between the trees, the rectangular, quincunx or hexagonal systems can be laid out. To stake a field to set by the square system,

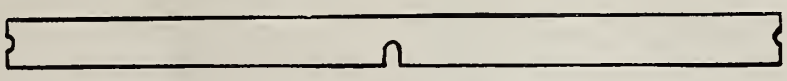
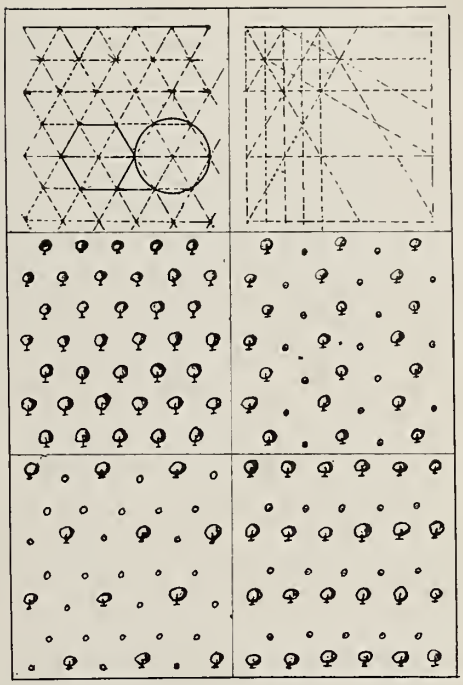
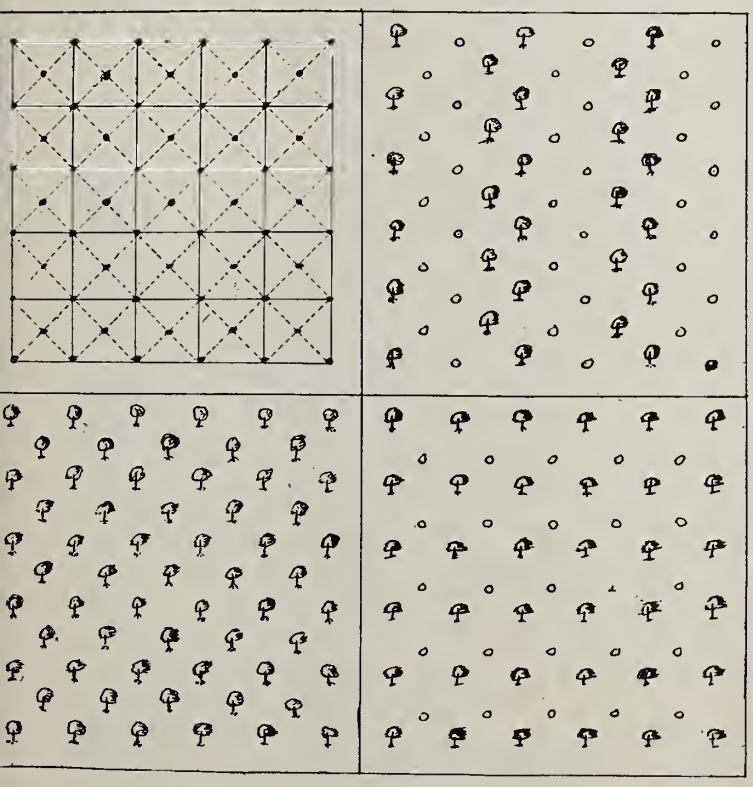


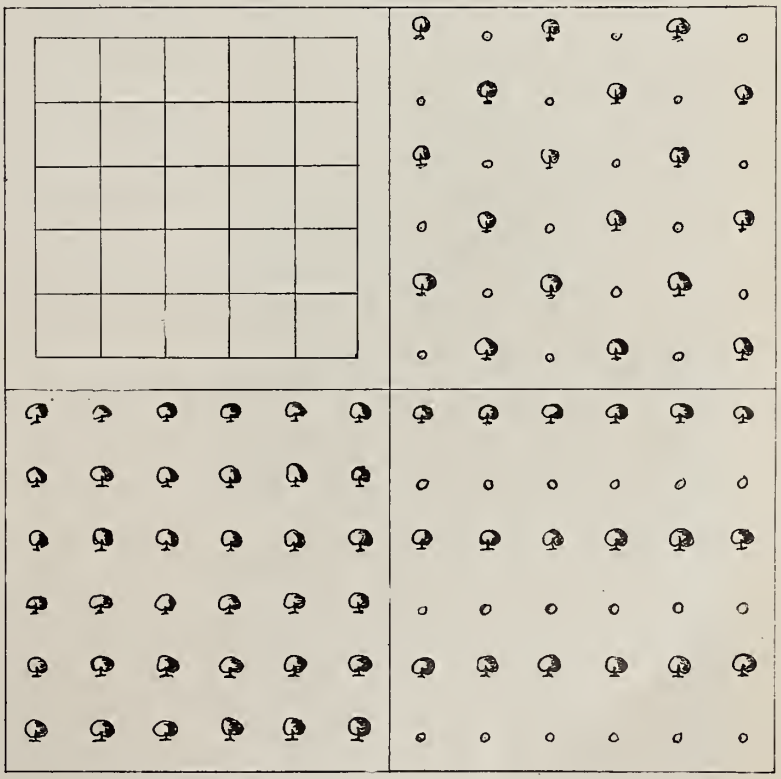
FIGURE VI—PLANTING BOARD



V—HEXAGONAL SYSTEM OF PLANTING
1, Field staked by use of triangle. 2, Field set. 3, Field properly thinned. 4, Field partly rowed off by running lines. 5, Improper thinning. 6, Improper thinning.



IV.—QUINCUNX SYSTEM OF PLANTING
Field staked off — Improper thinning
Field set — Proper thinning



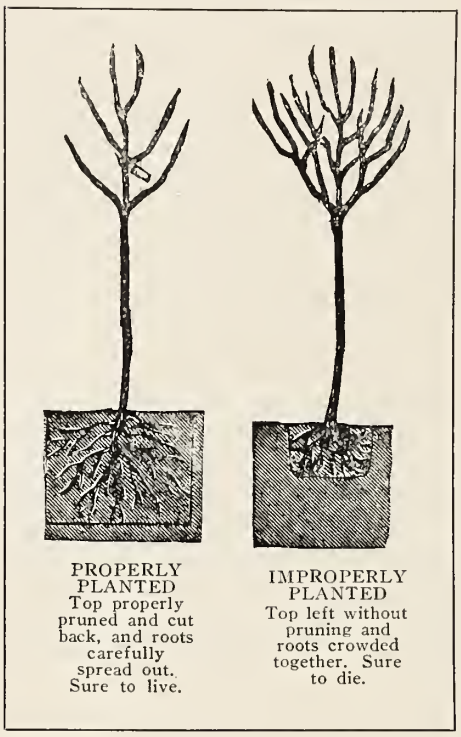
SQUARE OR RECTANGULAR SYSTEM OF PLANTING
Field lined — Proper thinning
Field set — Improper thinning

a triangle with one 90 per cent angle and with the two legs equal in length to the distance required between the trees, must be employed. By placing the vertex of the larger angle on the first peg of the base row, and the extremity of one leg on the second peg, the end of the other leg will mark the position of the first tree in the second row, and upon continuing the performance by advancing one peg at a time along the base line, the second row is laid out. The rest of the field is staked out by using each succeeding row as a base from which to locate the next. On uneven land special care must be exercised to avoid getting the rows curved. This can best be done by keeping the triangle level and locating the position for the stake by means of a plumb bob.

A field is staked for the quincunx system in a similar manner by using a right angle triangle, the hypothenuse of which is equal to the distance between the trees on the sides of the squares, and the legs of which are equal to the distance between the center and two adjacent corner trees of each group, or to the sides of the squares running diagonally across the field. It is also done by running lines diagonally across the squares of a field staked for the square system.

The hexagonal system is laid out in the same manner by using an equilateral triangle with sides equal to the distance desired between the trees.

The square system can be accurately laid out on level ground by means of a wire to which something has been securely attached at intervals of as many feet as is desired between the trees. After the base line is established, this wire, securely fastened near the first stake, with the first mark on it at the stake, is stretched across the field at right angles to the base line. When stakes are set at each indicator on the wire, it is moved to the second stake on the base line and another row of stakes set parallel to the first one; by repeating the entire field is staked. The trees can be placed exactly in the position of the stakes by means of a planting board, which device is very simple and is easily made from a light board about four inches wide and five feet long. The U-shaped opening in the center is placed about the stake, and pegs are driven into the earth through the holes near the ends of the board to mark its place. When this is done the board is removed, the hole dug and the board replaced on the pegs; the body of the young tree is then fitted into the opening previously occupied by the stake. The tree now occupies the identical position of the stake used in aligning the field. When the field is properly laid out the matter of getting the trees set in straight rows is made very simple by the use of this board.



Every individual, before planting an orchard, would do well to make a thorough investigation of the habit of growth and requirements of the trees he expects to grow, and plan his orchard accordingly. By so doing he will avoid the difficulties mentioned above. In their hurry some people lose sight of the fact that one of the most attractive features about an orchard is to see the trees properly aligned, and thereby fail to get them to look as nice as they could by devoting more time to the planting. When straight rows add so much to the symmetry and beauty of an orchard, why not every planter see that his trees are correctly placed?

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Table of Distances for Plants and Trees Giving Number Required per Acre

1½ x 4 feet apart	7,260
3 x 4 feet apart	3,630
6 x 6 feet apart	1,210
7 x 7 feet apart	889
8 x 8 feet apart	680
9 x 9 feet apart	537
10 x 10 feet apart	435
12½ x 12½ feet apart	280
15 x 15 feet apart	193
16 x 16 feet apart	170
17 x 17 feet apart	150
18 x 18 feet apart	135
20 x 20 feet apart	110
22 x 22 feet apart	90
25 x 25 feet apart	70
28 x 28 feet apart	55
30 x 30 feet apart	50
32 x 32 feet apart	42
35 x 35 feet apart	35
38 x 38 feet apart	30
40 x 40 feet apart	27

STRAWBERRY PATCH WITH PEACH ORCHARD IN THE BACKGROUND
Umatilla Government Project, Hermiston, Oregon

FIVE-YEAR-OLD CHERRY TREE YIELDING 150 POUNDS
Owned by Dr. Sanders, The Dalles, Oregon

THE MODEL WALNUT GROVES OF THE FUTURE

BY FRANK A. LIEB, SAN JOSE, CALIFORNIA

IN TAKING up this subject, we shall not, for lack of time and space, touch, at this time, on many very interesting points, such as: Transplanting the trees from the nursery to the orchard; the after fertilization, cultivation and irrigation of the transplant, and the harvesting, curing and profit of the walnut crop, but deal solely, for the present, with the more important subjects of selection of root and the selection of the variety with which to graft that root.

The importance of a thorough discussion of these two latter subjects is evident to every seedling walnut grove owner, since a careful survey of his trees will show some few, out of possibly many thousand, which, by reason of size, quality, quantity, and uniformity of their crops, are worth tree for tree from twice as much as the next best trees, to twenty times more than the very poorest, considering each tree as an income producer. What would it mean to him if all his trees were better than these few best ones? Such will be the future walnut grove.

These selections must be made from standard varieties now existing, from accidental crosses and seedlings of these varieties, and from intentional crosses to be made for the purpose of eventually combining the merits of many varieties In one.

Of varieties obtained from intentional bybrids, and their seedlings, we shall not now speak since none of them with which we are familiar has been given the sufficient orchard trial which is absolutely necessary to determine the commercial merit of any new fruit or nut. This leaves us then to a discussion of varieties more or less familiar to all of us.

IMPERIALE WALNUT ORCHARD
October 10, 1909. Royal hybrid seedling six years from seed, nearly eleven inches in diameter; probably the largest walnut for its age in the world.

IMPERIALE WALNUT ORCHARD
October 10, 1909. Splendid specimen of "Paradoux" hybrid, six years old from the seed.

Each variety of edible commercial nuts has a certain combination of what we may term unit characters or qualities, such as earliness in bearing, amount of bearing, degree of immunity from frost and blight, time of maturing nuts, growth of tree, self-hulling quality, shape, size, color, sealing quality and smoothness of the nut, and color, plumpness, flavor, size and keeping quality of the kernel. Obviously the perfectness of this combination determines the commercial value of a nut.

In nearly every case, nuts from fine varieties produce trees much inferior to the mother tree both as to nuts and growth, and so it is that in our seedling orchards we find so many trees producing nuts poor in both quantity and quality, compared to the original mother tree from which the nuts planted came; and in our grafted groves we find some trees twice as large as many of the others and producing twice as many nuts by reason of the stronger roots on which these larger trees were grafted. Half the purpose of grafting is lost if any but the best selected wild roots are used, for they, too, are only seedlings and will vary widely in their vigor and growth. And the purpose of grafting is as much to have a uniformly strong growing and heavy bearing orchard, as to have one producing uniform nuts, and this depends in large measure on the strength and vigor of the roots of the grafted trees. Since our orchard, then, must be a grafted and not a seedling one, let us discuss the merits of the various roots.

The French, and so-called English or Santa Barbara varieties are undesirable to grow roots on which to graft. Under the most favorable conditions, their growth is vastly inferior to either selected straight California seedlings, or selected seedlings of hybrids created by the crossing of the California walnut with either the Eastern black walnut or the English or French walnut. Under unfavorable conditions, such as excessive moisture, heavy, cold soils, thin soils or drouth, they are either stunted or actually die, where the various wild black varieties subsist and even flourish. The man who plants a walnut grove, either seedling or grafted on French or English root, will have to get more than double the price per pound for his nuts to keep up with the planter of a grove grafted on selected Royal, Paradox or California roots, for the trees of the latter planter will be more than one hundred per cent larger, bear more than twice as many nuts, make them larger and of much finer flavor. Each year, in the creation of new varieties, we plant a certain number of various French nuts which have been crossed with other varieties. The best of these at the age of two years is much smaller than the selected one-year-old blacks on which we graft, and each year thereafter the disproportion is greater. The future of an orchard grafted on selected black stock is shown by the Payne tree, now growing in Santa Clara Valley, California. This tree produced last year seven hundred and twelve pounds, which sold for a lit-

IMPERIALE WALNUT ORCHARD
October 10, 1909. Two-year-old graft of Bolivian black walnut.

IMPERIALE WALNUT ORCHARD
October 10, 1909. Five-year-old root and three-year-old Franquette graft. Showing number and size of walnuts. Result of selection of scions from heavy-bearing trees.

tle more than ninety-nine dollars. Nine such trees would fill an acre comfortably, paying eight hundred and ninety-one dollars. This, and dozens of similar grafted trees in Walnut Creek, the home of the California walnut, would seem to prove the inaccuracy of the statement that seedling trees are better growing and heavier bearing than grafted ones. This statement is not often met now, as it arises solely from ignorance of what a good, grafted tree is. Apparently in France no selection whatever is used in the stock to be grafted.

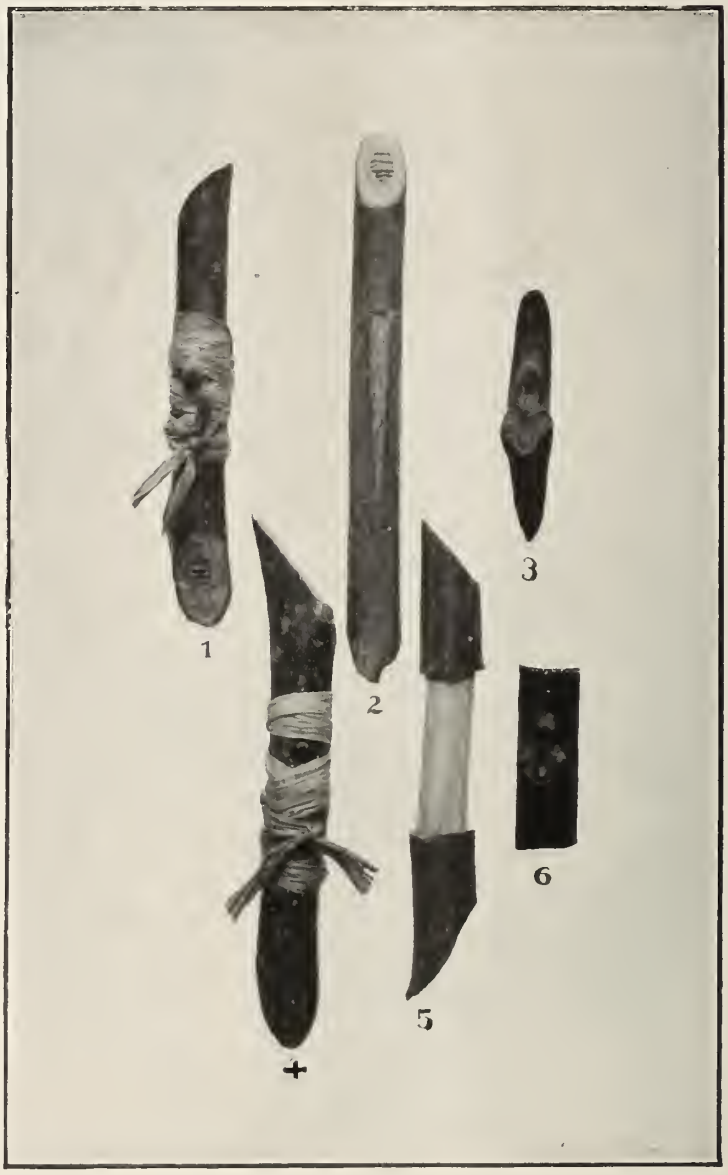
The Eastern black walnut can also be eliminated as a stock on which to graft, as it no more than holds its own with the California and Royal seedlings in moist, damp soils, while in dry soils the California, Royal and Paradox seedlings far excel it. Moreover, it sheds its leaves too early to be suitable for the late fruiting and late leafing French varieties.

The California has been perpetuated only by planting seed, and it is so common a practice to plant the Eastern black near it, that inter-pollenization frequently takes place, and the nuts so crossed produce many splendid specimens of the Royal hybrid. The California will always be a great favorite, as it grows and does well in a wide variety of soils and climates. It is not a heavy bearer, however.

The Paradox hybrid (the California crossed with English) though sometimes an enormous grower, is as yet, so far as we have tested the same, of little value as a parent of seedling for stock, since the seedlings are as a rule weak growers compared to the parent, and, saving one specimen of this cross, it is almost barren. The largest specimen we have ever seen is over four feet through, but only produces about a hatful of nuts annually. Owing to its English blood doubtless, it does not thrive where the water table is close to the surface, under which conditions the California and particularly the Royal seedlings far excel it. However, if this cross can be reduced to a fixed variety, reproducing fairly true to seed, it will be exceedingly valuable for dry, sandy or gravelly places where the water table is far from the surface, as such direct crosses as we have growing in such locations are growing much stronger than the trees of pure black blood.

The Royal hybrid, every cross between the California and the Eastern black walnut, has in our opinion the most magnificent specimens growing in the walnut line, but its seedlings are almost as bad to retrograde as is the case with the Paradox. At present, out of a great many which we have tested, we know of only three trees which are sufficiently

CLEFT GRAFTING OF WALNUTS
When larger stocks are used two cuts through the sap wood is to be preferred



Courtesy Oregon Agricultural College

1, 2, 3, SHIELD BUDDING WALNUTS; 4, 5, 6, FLUTE BUDDING

THOMPSON SEEDLESS GRAPE, SHOWING BEARING QUALITIES AND HABIT OF GROWTH. FRESNO NURSERY, FRESNO, CALIFORNIA

fixed to grow a fair percentage equal to the parents. But these are splendid. Most exceptionally large Royal hybrids and California trees grow less than two per cent of their seedlings equal to the original, so it is a matter of no little experiment to find or produce a specimen of either which will produce 15 to 20 per cent.

In Bolivia there are lumber companies formed for the purpose of converting a magnificent variety, called the Bolivian black walnut, into hardwood lumber of the very highest quality. We find that the seedlings of this variety vary greatly, but even the best of them, in our climate, are inferior to the selected seedlings of either California or Royal trees, except in one regard. It grows where the land is so swampy that no other walnut can live. However, it will do better when it can be acclimated either by several generations of seed selection or by crossing with California or Eastern. Bolivian summer comes in our winter months, and this may account for the fact that this variety begins in the latter part of August or the first of September to make a strong second growth, which continues until the first autumn frosts. This, of course, checks the tree somewhat each year.

By our system of sprouting, four-fifths of the weakest-growing nuts of any variety can be eliminated by purely mechanical means, since the strongest-growing trees come from the nuts which sprout towards the first. The late sprouts, with very few exceptions, make weak trees. Each variety, of course, has a little different time when it begins to sprout its nuts, and this must be known to take advantage of the fact that early sprouts make the strong trees. About 25 per cent of such planted sprouted nuts from our selected trees of Royal hybrid blood and 15 to 20 per cent from our selected California trees grow, with us, three to four feet or better the first year. These are grafted, making four to six-foot growth on the average for the year's growth. The rest are not used for grafting purposes; for a tree which is to have in the orchard from sixteen hundred to thirty-six hundred square feet cannot in our opinion be too good, either as to root or graft.

So much, then, for root selection.

Now, as to scion selection: Where practicable, a variety should be improved and finally fixed—if such a thing is possible, and we have reason to think that it is—by bud selection. For instance, as a start in this direction, we got grafts from the best bearing Franquette trees in the best orchard of grafted Franquettes, the Vrooman orchard, and grafted them on a row of large blacks. Some of the grafts produced more walnuts and of larger size than the others, although all were of the same type. From these heaviest bearing scions we got grafts for our nursery stock and orchard trees. The result was that we got a few nuts the second year, with a rapid increase each year thereafter. In grafting we cut our scions long, so as to have four or five sprouts from which to select for our future tree. When it is evident which is the strongest sprout, the others are cut off. This gives, with the Franquette, a growth of four feet or better, grafted on a one-year-old root. In the same soil and nursery it takes a French seedling three years to make such a top, and the root is still inferior in soil penetration.

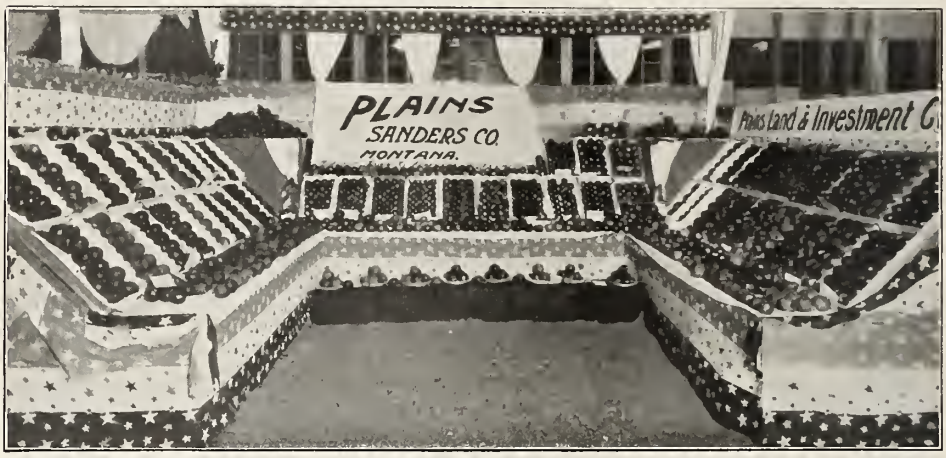
We shall make the discussion of edible varieties as brief as possible.

PART OF A BLOCK OF SPITZENBERGS
In nursery of Portland Seed Company

The Santa Rosa and Santa Barbara varieties are with us inadvisable, owing to their susceptibility to frost and blight, which leaves us the standard French sorts and their seedlings. The leading standard kinds are as follows: The Bijou, large, rough, not well filled, but delicious flavor; the Parisienne, shapely, good size, flavor inferior to Franquette or Mayette, not tested here commercially; the Vourey, good flavor, too small, good for candy purposes, but any variety has enough small nuts for this trade, which does not pay the best price; the Meylan, large, beautifully shaped, untested in orchard form; the Mayette, highest priced nut in France, shapely, but untested here in orchard form, a little more susceptible to blight than the Franquette, and owing to unreliability of French nurserymen, few either in California or Oregon have or know the genuine Mayette. Our importations from France gave us a small percentage of genuine Mayette and half a dozen different types of Mayette seedlings, differing greatly in their vigor of growth and their susceptibility to blight, that biggest bugbear to walnut culture. And the Franquette, large shapely, oblong, thoroughly proved in orchard form, both in the Vrooman orchard and in our own groves; the favorite nut in England, and selling in France for only a fraction of a cent a pound less than the Mayette. With the Mayette, it has been handed down for more than a century and a quarter, without change or improvement, and, although blight conditions there are much worse than here, yet it has never suffered any serious loss from it.

In this connection it is interesting to note that the walnut blight that has caused Southern California so many thousands of dollars loss, was, and still is imported from France by persons ignorant of its existence there. The French people call it by the unobtrusive title of "black speck."

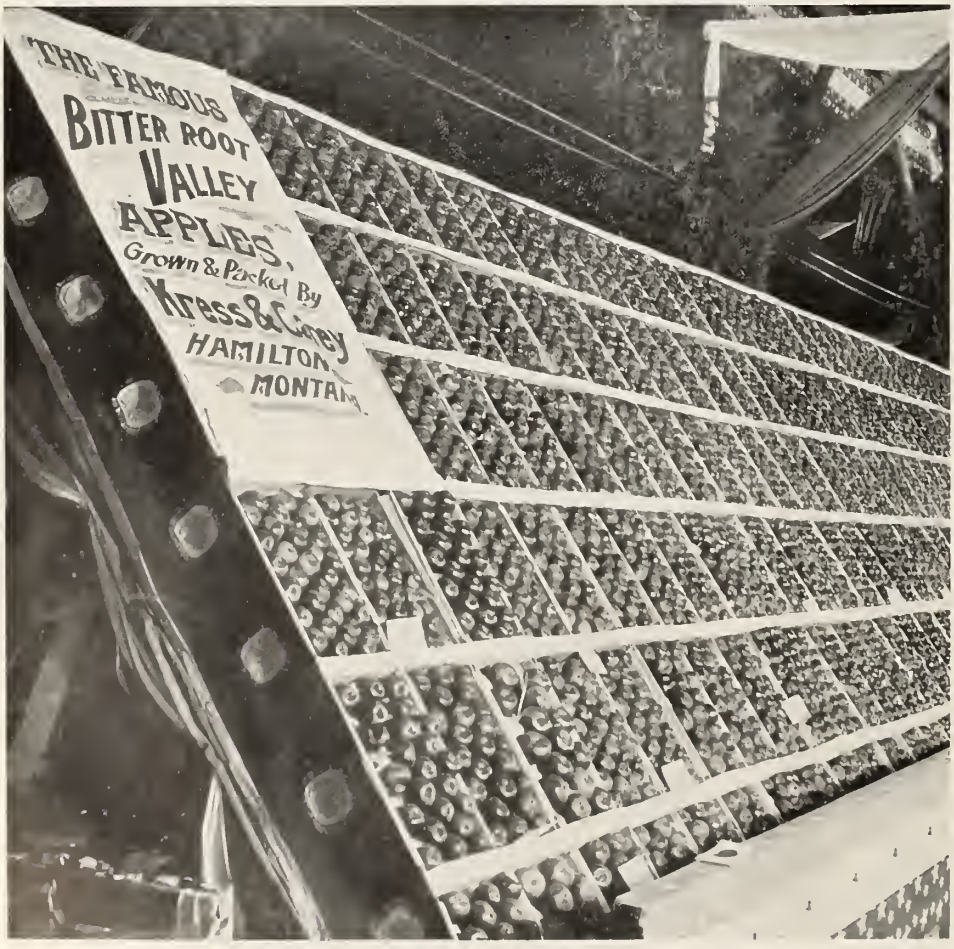
It is also interesting to note that there is still in France a greater menace in the form of a little worm or weevil, which bores into the green nut and destroys it. The French have no unobtrusive name to give to this pest, so they ignore it; but our consular reports are less considerate, and frequent references is made in them to the loss occasioned by it in France, some years being much worse than others. It is also found in the ripe nuts, and in that lies the danger of it being imported into this country, for some nurserymen import nuts so that they can advertise "Genuine first generation Franquette and Mayette." We hope that our walnut readers will agree with us that here is a case where an ounce of prevention is worth a whole carload of cure, and see to it that the inspection officers of Oregon are warned of this pest, as have ours of California.



MONTANA EXHIBIT FROM THE BITTER ROOT VALLEY, AT NATIONAL APPLE SHOW SPOKANE, WASHINGTON, 1908

Of the French seedlings and hybrids, there are many of great merit, including Prince, San Jose Mayette, Concord, Wilson 2, Wilson 4, No. 1 South, No. 1 North, Chase, and many others, but in all these there is something lacking that keeps them from being in the same class with the Franquette and Mayette—one has insufficient catkins to properly pollenize its nuts, another has a dark shell and kernel, several are poorly sealed, some are too small, some have too thick a shell, some are not especially good flavored, some are very susceptible to blight, etc., and those which have been tried in orchard form have not proved as successful as has been the cases of Franquette plantings.

To sum up, then: The future walnut grove will be a grafted one, inasmuch as this permits of a uniformly strong root, a top taken from heavy bearing trees, a uniform product and a uniform price for the same; this root will be selected from the best proven mother trees of California, Royal hybrid or a cross of these two with Bolivian black, and the top will be Franquette, Mayette—preferably every other two rows of each, for the sake of inter-pollenization—or some French seedling or hybrid which eventually proves itself better than either the Franquette or Mayette. This grove will pay more at the age of ten years than does the present seedling one at the age of fifteen to twenty.



PRIZE-WINNING CAR OF M'INTOSH RED APPLES
Exhibited by Kress & Carey of Hamilton, Montana, at the National Apple Show, Spokane, 1908

OLD APPLE ORCHARDS SHOULD BE TOP GRAFTED

BY M. O. LOWNSDALE, LAFAYETTE, OREGON

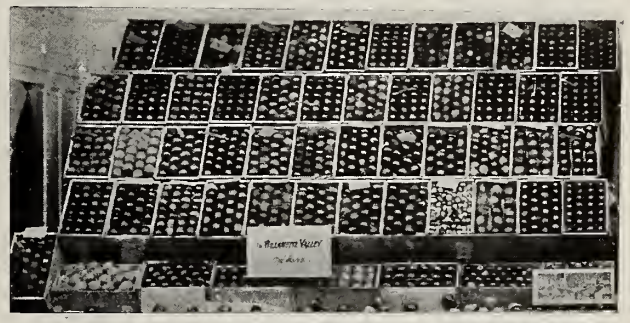
ALL the "old" apple orchards of the valley are infected with a very dangerous and contagious disease. This disease is caused by a minute fungus which gains entrance to the inner tissues of the tree and burrows along under the bark, appearing at certain spots on the face of the bark for the purpose of spore-formation. The fungus grows wholly under the bark, hence its active principle cannot be reached by any spray, and the only benefit that can possibly be derived from such a treatment (beside the natural tonic effect of a Bordeaux mixture) would be the possible prevention of spore-generation if sprays are applied at exactly the right moment. To be effective in this direction, applications must be made with the beginning of early rains in autumn—a time when every fruit grower is snowed under with other work that will not be denied.

The fungus is a perennial and, having gained entrance to the inner tissues of a tree, it will follow along each succeeding year's growth and produce its debilitating canker-spots as long as the tree lives. This disease will be found rampant in every old orchard in the valley, and its disgusting sores are the principal cause of the decadence of the apple industry in this, the original "land of the big red apple." Almost every old apple tree is so badly affected with this filthy disease that all of its energies are exhausted in an effort to repair the ravages of this voracious parasite and little vitality can be put into the fruit. Thus are apples from these debilitated orchards robbed of their keeping qualities and of much of that exquisite flavor that for a generation has distinguished the fruits of vigorous trees in the same localities.

BEST FIVE BOXES, HOOD RIVER APPLE FAIR, 1908
By the Editor and Publisher of "Better Fruit"

As the fungus causing this disease is at all times hidden under the bark, the only method of cure is to cut off affected branches or to cut out infected tissues. In old apple orchards this means practically the removal of the whole top. In these severe cases, half-way measures are worse than useless.

This treatment is simply a severe pruning, and in no sense is it a menace to the life of the tree. In fact, it is the only method by which thrifty trees can be produced from the decaying wrecks that everywhere are blotching the face of the valley. These old cripples, these foul and cankered sources of contagion that are so piteously spoken of by the fellow who doesn't want to clean up as "old friends of a generation around whom cluster so many tender memories," etc., ad nauseum, if given a tithe of the care and attention that "old friendshop" should demand, would in three or four years be sturdy, vigorous orchards of immense economic value to our state. It will at once be noted that there is no desire to destroy a single tree. On the contrary, an earnest attempt is being made to make assets of great value of what are now worthless incumbrances—aye, even worse than worthless, for they are distinct menaces to a great industry, and, like all other great nuisances, must be abated. When removing these tree tops, a thought should be given to the subsequent care of the new growth. All trees should be headed back low enough that they may be properly and economically sprayed and otherwise treated and their fruit picked easily and cheaply. Consideration should also be given to the varieties to be grown on the new growth. The vast majority of valley trees bear fruit that is of little commercial value, and varieties should be so changed that we will soon have a great commercial output of a staple variety. The Yellow Newtown is recommended as the best variety with which to top-graft these old trees.

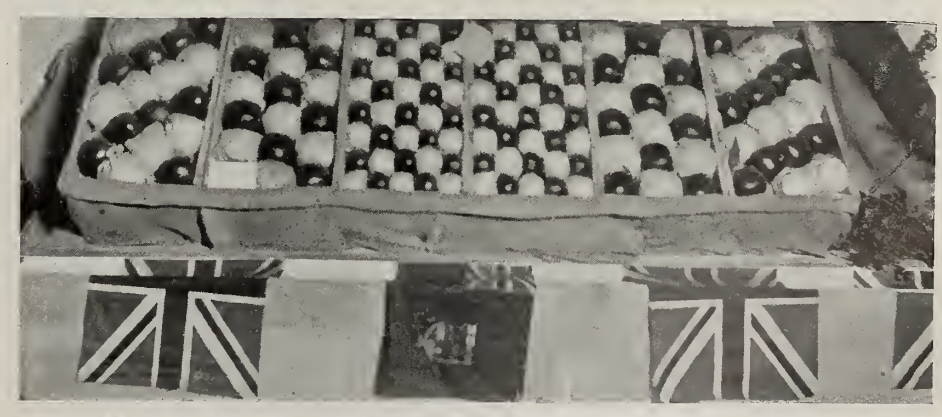


FINE EXHIBIT OF APPLES FROM WILLAMETTE VALLEY IN A SHOW WINDOW AT PORTLAND, OREGON

The Yellow Newtown tree should never be planted in the valley as a nursling. If it is desired to establish a Yellow Newtown orchard, some thrifty grower as the King or Ben Davis should be planted, and after five years be top-grafted. It is because the Yellow Newtown needs a thrifty and powerful root system to get it in motion in the valley that it has been deemed wise to top-graft these old orchards with that variety. There are many other considerations that lead to the same conclusion.

There are many methods of top-grafting these trees that are equally successful, but it will be sufficient to point out such as will give the best results to the average farmer. While all methods of grafting require a certain amount of skill, yet a knowledge of practical requirements and close attention to detail, both during and after the operation, will enable any earnest student to graft successfully by all the methods described herein. Any method, however, will fail if heedlessly performed and if careful attention be not given to the growing scions.

It is not difficult to insert scions in the top of a stump. A perpendicular cut is made through the bark and enough of the sap-wood to give a little stiffening to the scion, care being taken to cut obliquely, so that the wood may be lifted a trifle to insert the scion. The scion shoould be quite thin and cut more on the side next the outside bark than on



FANCY PACK OF APPLES FROM VICTORIA, BRITISH COLUMBIA, AT NATIONAL APPLE SHOW, SPOKANE

its opposite toward the heart of the tree, so that two cambium tissues may coincide when the cut is opened a trifle. The top of the stump should be waxed as well as the wound about the scions, and of course the top of the scion must also be covered. In methods of grafting into large stumps, when scions begin growth, care should be taken to rewax about the scions if the wax cracks in the least. Many grafts are lost by neglect of this precaution. This operation should be performed in May, or, at the earliest, during the latter part of April. There is very little danger in cutting off the entire top of trees at that time, and scions will start more quickly than if the tops are removed earlier in the year. Scions should not start their growth much before the 6th or 10th of May, as our early May frosts are very fatal to the tender grafts. On May 7, 1894, a belated frost robbed me of about 90 per cent of growing scions in 4,000 top-grafted apple trees. I have good cause of advising delay. Care must of course be taken that scions are so cut and placed that the cambium tissues should coincide on each side of the graft. Some grafters try simply for a "cross" in this method of grafting—that is, attempt only to secure a crossing of the cambium tissues at some point, attaining this end by an oblique setting of the graft. Often this method succeeds well, but it is much better to take more care with the cut and unite all the cambium tissues for a long distance. After making the cut in the stump, the wound will be opened a trifle by a turn of the wrist before withdrawing the knife. Care should be taken at that moment that the wood is not split.

Another detail of grafting at the season I advise is that scions should be kept moist in the fields before insertion and should be protected from the sun and from winds. They should always be whittled at the tree and preferably as each graft is set.

Perhaps the easiest method of top-grafting old trees is to insert the scions in cuts made through the bark as if for budding. Grafts are slipped under as in budding and an elliptical opening is cut for the scion by trimming the bark lips a trifle. The bark lips are then laid down again behind the scion and tied with raffia, or are held in position by some other simple device. The purpose of this tying is to prevent the swelling of the bark lips when the graft begins to draw up sap. Sometimes grafts are pushed out of the bark if not tied. The opening for the scion should be only large enough to permit the bark to fit snugly around the scion. Otherwise wax would flow in under the scion and prevent a union.

Another and a very sturdy and satisfactory method is to insert scions in an oblique cut. This method requires a little practice in order to be sure of setting the scion so that the cambium tissues shall coincide. Success in that endeavor will give a splendid and hardy branch. Of course, in all these methods waxing all wounds and the tips of scions is imperative. As soon as scions begin to swell, the wax should receive attention, and in these large stumps the grafts will probably all demand rewaxing, perhaps several times.

RESIDENCE OF F. E. PATON, NEAR CLACKAMAS, OREGON
Built with the big red apple

After grafts have grown about eight inches the terminals should be pinched off, in order to escape the winds of about July 6 to 10, and to give sturdiness to the new wood and the union. When they have grown another ten inches they should be pinched again—twice in the first summer; pruning of two years in one.

If it is desired to change the variety, the trees may be top-grafted the following spring. It is not necessary to describe this operation, as it is the simplest of all grafting methods.

All old apple trees, when cut back severely, whether top-grafted or not, should be well cultivated during the first summer, and no stock should be permitted in such an orchard, especially before July. June of last year was a cold month and many apple trees that had been cut back struggled a long time before they could start, and in such seasons it is very essential that the ground be kept warm by frequent cultivation.

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BETTER FRUIT sincerely and honestly believes that it is doing more for every fruit section of the Northwest territory than any other single publication in existence, and on account of the large subscription list which we have in the East we doubt very much if all the other papers devoted to horticulture put together are doing for the fruit industry of the Northwest what "Better Fruit" all alone is doing

FARM HOUSE NEAR CALDWELL, IDAHO

THE MAKING OF A FRUIT DISTRICT BY IRRIGATION

BY C. E. WEATHERSTONE, OMAK, WASHINGTON

THE reports of the United States Department of Agriculture relative to the production of apples in this country, showing as they do that the production of this king of fruits has decreased steadily for the past dozen years, are food for thought by the fruit grower.

To the Western orchardist the message they bring is one of increased prosperity, for the West is growing apples on a business basis and making it part of the business to see that orchards are kept free from pests and disease that are destroying Eastern orchards, and in that way are responsible for the diminished production. It means a shifting of the apple industry from the Atlantic to the Pacific coast, at a time when the demand is steadily increasing.

In view of these conditions, which guarantee a ready market at good prices for all of this fruit that can be produced, the development of a new fruit district of the highest class deserves more than passing mention. Such a district is the great Okanogan country, extending from the Columbia River northward a hundred miles along the river by that name into British Columbia, but centering about the great United States government irrigation project, located near the center of Okanogan County. Here, at a cost of about five hundred thousand dollars, the United States Reclamation Service is placing under irrigation ten thousand acres of the most beautiful and fruitful land to be found anywhere.

Until within the past half decade this whole country was a stockman's paradise, and but little attention had been given to horticulture. Some of the cattlemen had, it is true, planted small orchards, mostly of inferior varieties, but interspersed with an occasional Spitzenberg, Yellow Newtown or Winesap. It was these haphazard orchards, neglected and unappreciated as they have been, that last autumn furnished the fruit that captured forty-five premiums on plate exhibits of apples at the Spokane Interstate Fair, or 34 per cent of the entire one hundred and thirty-three premiums offered, including premiums on Yellow Newtown, Winter Banana, Winesap and Spitzenberg. This was in competition with eight other districts, and the record is all the more remarkable when it is known that only six varieties were exhibited from this county that were not awarded prizes.

ORCHARD IN BLOOM NEAR OMAK, WASHINGTON, IN OKANOGAN COUNTY

In this locality are found in combination all of the qualities to be desired in a fruit district. The soil is rich in all of the elements of plant food, with an abundance of the potash so important in giving high color to the fruit. Evidence of this is to be seen in the fact that trees bear heavily every year, generally setting much more fruit than they can mature properly. The bright, warm days, with an abundance of sunshine complete the high coloring and give our fruit flavor and texture, while our northern latitude and cool nights, due in part to the influence of the mountains nearby, guarantee its keeping qualities.

But it is of another feature that I would speak more particularly. Lying, as this land does, in a series of benches or terraces above the river, the drainage, both with reference to water and air, is practically perfect. This excellent air drainage, which prevents cold air from accumulating, insures practical freedom from frosts. And when with this it is known that this locality is free from the warm "chinook" winds that in some localities melt the snow and start the dormant fruit buds before the danger from frost is past, the fruit grower will recognize this as a locality in which a full crop each year can be assured. That this is the case is made evident from an affidavit recently subscribed to by Hon. J. O. Pogue, the retiring state senator from this district and the earliest settler on the lands embraced under the government canals. Senator Pogue states in this affidavit that in the sixteen or more years since his first trees came into bearing there has not been a failure of his fruit crop from frost or other cause, and that this applies to apples, peaches, pears, apricots, cherries and every variety of fruit ordinarily raised in this locality.

A GOLDEN HARVEST AT OMAK, WASHINGTON

Along the same line C. F. Blanchard, statistican for the United States Reclamation Service, recently wrote in the National Geographic Magazine relative to the lands included in this project: "The land is very fertile, and owing to the exceptionally favorable climate, a wide variety of products, many of which are high priced, are produced. Frost has never injured the fruit in the valley in which this work is located, and there has never been a failure with apples, peaches, plums, apricots, prunes, pears, cherries, nectarines, grapes, and all varieties of small berries grown in the United States."

James R. Garfield, Secretary of the Interior, recently wrote further: "The climatic conditions are different at the Okanogan project from any others now under way, and it offers fruit growers the best opportunities."

From these authorities it is evident that the frost danger, which is so important an element for consideration in some localities, need not be largely considered here.

The water supply, too, is assured. Unlike many private concerns, the government does not extend its canals to include more land than there is water to irrigate properly, as there is nothing to gain by so doing, and the settler on lands under a government canal is assured, not only that there is sufficient water to irrigate his land, but that the system of water distribution and division is such that he will get the water at the times when it is needed. All litigation over water rights and ditches is absent also under a government canal, as there is no opportunity for actions at law. The Secretary of the Interior has recently announced that water will be

A GOOD EXAMPLE OF "CLEAN CULTIVATION," AND A WELL-CARED-FOR ORCHARD FROM WHICH MAXIMUM RETURNS ARE ASSURED IN THE BITTER ROOT VALLEY, NEAR HAMILTON, MONTANA

furnished during the season of 1909 for the first unit of 3,472 acres under this project. The canals for the entire area were completed early in 1908 and progress on the great dam to impound water in the mammoth reservoir near Conconully has progressed to the extent that water can be stored this season to supply that acreage, while the entire ten thousand acres will be furnished water during the "flood water" season of May and June. It has been demonstrated that trees can be started with flood water, and with good cultivation, go through the season in good condition. Several hundred acres were started in this way in 1908, and the coming spring will see large plantings in this district.

As a result of the government's work here, one new town has been born. It is Omak, located at the center of the project, where only a few short months ago was an alfalfa field. Its right to exist is firmly based on geographical and topographical conditions, which make over 80 per cent of the lands included in the project directly tributary to it by easy, natural down grades, and abundantly justify its claim to the title of the "Irrigation City." It is now an enterprising village of one hundred and fifty people, in the center of a district possessing almost every natural condition desirable in home-building, and seems destined by nature to be the largest city in the valley of the Okanogan River.

The lack of railroad facilities throughout this valley has hampered the progress of this section in the past most sorely, but present indiciations point very strongly to this need being soon supplied; and in any event, we are money ahead by being here first.

SAVING A CROP FROM FROST
Oil pots in action, heating an orchard, Grand Junction, Colorado

THE BEAUTIFUL BITTER ROOT VALLEY, MONTANA

THIS beautiful valley is the largest and most eastern of the few valleys in the celebrated Pacific fruit region. On the west side is the majestic main range of the Bitter Root Mountains, while on the east is the secondary range of the Hellgate Mountains. Completely hemmed in and sheltered from heavy winds and rough weather, it seems as though the Creator had taken special pains to protect this gem of His genius and make of it an ideal home for mankind, where Mother Earth shall yield her fruits and grains in abundance and neither extreme heat nor cold shall annoy.

The valley is a great panorama of indescribable beauty. Up and down it are well tilled ranches rolling over the foothills to the pine-clad and snow-capped mountains, some with their growing or ripening crops, others with orchards in beautiful bloom or heavy with fruit. As one looks over this munificent effort of nature he cannot but agree that the valley has been rightly named "The Garden Spot of the West."

The Bitter Root was settled nearly fifty years ago and fruit has been successfully grown in it for over thirty years. The valley proper is about eighty miles in length, with an average width of eight miles. Infinite romance and historical interest attach to this place. It was here that Lewis and Clark found the friendly Flathead Indians gathering their annual supply of bitter-root and camas, which they pulverized and used as flour. The two explorers were exhausted and without food or horses. This peaceful tribe fed them, furnished them with supplies and sent guides to lead them to the Pacific.

"BETTER FRUIT" MAILING DAY, SHOWING BAGS FOR THE NORTHWEST
The Eastern mail is not shown in this scene, but is not quite one-half as large

The Bitter Root Valley lies chiefly within Ravalli County, Montana, which was named for the Jesuit missionary, Father Ravalli. There are about 15,000 prosperous people living here, 3,000 of whom are in the chief town and county seat, Hamilton, which is forty-eight miles directly south from Missoula. Marcus Daly established this town in connection with his lumber interests and famous Bitter Root stock farm.

From a geological point of view the Bitter Root Valley is one of the most interesting in the world. Its canyons are the wildest and most rugged known for a mountain region of 10,000 feet elevation. They are more like the canyons of the Andes or Himalayas, and afford never-ending delight to the mountaineer. Torrents and precipitous falls are to be

PART OF THE BEN KRESS ORCHARD AT HAMILTON, MONTANA, IN THE BITTER ROOT VALLEY. EIGHT-YEAR-OLD M'INTOSH RED APPLES

found in any of the thirty canyons which border the valley. Amid all this rugged mountain scenery lies the valley itself, almost level to the eye, and as quiet and peaceful in coloring as can be imagined. It has been said, probably with truth, that no man visited the valley and went away disappointed.

For more than thirty years fruit has been successfully raised in the Bitter Root Valley. This fact is interesting because it shows that fruit growing in this locality is no longer an experiment, and that the life of an apple tree is over a quarter of a century, and that, while profitable after the fifth year, reaches its maximum of profit at twenty years. The oldest trees in the valley are five owned by Amos Buck of Stevensville, which are thirty-one years old, and in 1908 produced eighty-four boxes of McIntosh Reds.

It is impossible for any writer to do justice to the valley or its products. Even the most skilled artisans can only approximate the beautiful color of the McIntosh Red, while its fragrance and flavor are indescribable. It is impossible for printer's ink to reproduce, even from the best photographs, more than a suggestion of the beauties of this valley and its magnificent mountains.

At every stage of the world's progress the conservative half of humanity looks backward at the opportunities that are past and is forlorn with the idea that the golden days of opportunity will never return. Many a man of the present day in the upper Mississippi Valley can remember when he passed through Chicago or Minneapolis years ago and could have bought realty for $500 that would have made him independent and comfortable for the rest of his days. There are those who can recall when they or their fathers owned homesteads within the limits of these cities, 160-acre tracts, that are worth millions today. Others recall when they could have bought land in Western Minnesota and the Dakotas for two dollars that is now worth fifty dollars an acre. Those who look backward to these past opportunities are apt to sigh and assume that the day of opportunity has gone forever. There never was a greater mistake.

The United States has made good its claim to the title, "The Home of Opportunity," and the famous Bitter Root Valley, with its majestic scenery, invigorating air, pure water, productive soil and the McIntosh Red, unquestionably offers more opportunities to the square mile than any other section of the country.

When all of the Bitter Root Valley shall have been developed and put under thorough cultivation it will produce fruit to the value of $120,000,000 annually, or twice the yearly output of minerals from the entire state.

With a rapidly increasing domestic population that is out of all proportion to the increase of apple production, there is no danger of exceeding the demand at home, while ignoring the fact that every year several European countries are drawing more heavily upon our Western orchards.

More than thirty years of experience has proven that apples can be grown most profitably in the Bitter Root Valley. Eminent horticulturists admit that these apples are unexcelled, an ample market and good prices are assured, and crop failures are unknown. What more can one ask for as an investment?

With an ideal climate in one of the most beautiful and fertile valleys in the world, where game and fish abound, with refined and well-to-do neighbors about one, good schools, churches, excellent roads and railways, what more can one ask in the way of a home?

* * *

OF ALL the fruit sections of the great Pacific Northwest the Bitter Root Valley stands unrivalled in many respects. Its transportation facilities are better, being as it is several hours nearer the Eastern markets and having a great under-supplied home market into which millions of dollars' worth of food stuffs are shipped annually. In the year 1907 the Bitter Root Fruit Growers' Association shipped 132 cars of apples and one car of cherries to outside markets. This year the crop is estimated by competent authorities as being far in excess of that number and the valley will ship 190 cars to markets in all parts of the United States and Canada. Hamilton will lead in the shipment of apples with a total of sixty cars, while Darby will rank second with a total of fifty cars. Woodside and Victor will each ship thirty cars and Stevensville ten cars. Small shipments from other points are not considered, but

A PROSPEROUS ORCHARD HOME IN THE BITTER ROOT VALLEY, NEAR HAMILTON, MONTANA

A BIT OF TYPICAL BITTER ROOT SCENERY, MONTANA

will swell the total materially. There are 1,000,000 apple trees in the Bitter Root Valley at the present time, counting the trees that were set out in 1909, and as the trees are planted 100 to the acre this means that there are 10,000 acres planted to apple trees. This number will be largely increased in the next three years.

* * *

TO THOSE who have never seen Bitter Root apples they are certainly a revelation. Large, luscious, brilliant, perfect in form and color, not a worm hole or a blemish in a hundred thousand boxes, they are the most marketable product on earth. For a distance of nearly one hundred miles there is a succession of well-tilled farms and magnificent orchards, the product of which both in quantity and quality, cannot be excelled. Climatic and soil conditions have made this valley an ideal orchard site, the water supply guaranteeing immense and never failing crops remarkable for crispness, color, flavor and beauty. A visit to this valley during the fruit season is well worth while, and will reveal some wonderful sights. It is not uncommon to see very small trees so loaded with fruit that it becomes necessary to prop the limbs or place a tripod of rails above it to which the branches are tied. The yield at times is phenomenal. Fruit has been grown for thirty years; the better methods of culture and variety adapted to the soil and climate have been learned, and fruit growing is now one of the most important industries in the country. Apples, plums, cherries, apricots, pears and prunes grow to perfection and in profusion. Worms and insects are unknown, the fruit is large, of delicious flavor, and unexcelled in keeping qualities. Berries are the pride of the valley and grow in perfection, having no competitors in the market for size and flavor, and always command the highest prices.—From the Report of the Montana Bureau of Agriculture, Labor and Industry.

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THE Bitter Root Valley is one of the most promising fruit regions in the Northwest — a country in which fruit growing has reached the highest point of perfection in the United States. The Bitter Root Valley is peculiarly adapted to the production of McIntosh, Wealthy and Alexander apples, the Transcendent crab, and hardy pears. It is also one of the very few fruit districts in the United States where there are no serious insect enemies. The absence of the codling moth makes it possible to sell the Transcendent crabs in Eastern markets at a very good profit to the fruit grower. Because of this fact, and the very superior crabs grown in the Bitter Root Valley, the market for crab apples is sure to increase as the production increases. I know of instances where from twenty-five to thirty boxes of crab apples per tree have been gathered. These apples net the growers about $1.15 per box. The profits to be made in growing crab apples can easily be seen. The production of standard apples, pears and cherries is equally as profitable, and because of the comparatively cheap land in this fruit district, the total absence of the insect enemies, and a soil and climate so well adapted to fruit production, the Bitter Root Valley offers the best inducements for the intelligent fruit grower. I have figures from one orchard of 1,250 trees which are now ten years old which produced on an average through three years 5,824 boxes per year. Another orchards of 12,225 trees six years old produced on an average through three years 1,922 boxes per year. Another one of 875 trees, eleven years old, in four years produced on an average of 1,652 boxes per year. Another orchard of 1,258 trees sixteen years old produced through three years an average of 2,292 boxes per year; 1 213 trees ten years old produced through four years an average of 1,650 boxes per year; 423 trees fourteen to twenty years old produced through four years an average of 1,116 boxes per year. When the fact is taken into consideration that the figures above given are for a period or three and four years, covering as it does the alternate bearing year, it is seen that the Bitter Root Valley can produce extremely large yields of marketable apples.—R. W. Fisher, horticulturist Government Agricultural Experiment Station, Bozeman, Montana.

FIGHTING FROST IN GRAND VALLEY, COLORADO

BY JAMES RICHARD LANCASTER AND ROBERT HUGH SKEGGS, GRAND JUNCTION, COLORADO

THE superb color, splendid keeping qualities and delicious flavor of the fruit raised in the Grand Valley, or the Grand Junction fruit district, Colorado, is well known the world over. As late as the year 1902 there yet remained hundreds of acres of arid land which could be bought as low as five dollars per acre, and in some sections of the valley lands could be bought for even less price. However, a portion of the unlimited amount of water from the Gunnison and Grand Rivers has been brought into use for irrigation purposes, which has caused a steady increase in the price of this land until bearing orchards are now selling as high as $1,500 per acre, alfalfa fields from $150 to $300 per acre, and raw land ranging in price from $50 to $300 per acre. As a result of the irrigation thousands of acres of arid land has been brought under cultivation.

On account of the increased amount of water placed upon this land during recent years, the climate has been changing gradually from year to year, and during very recent years frost has been making its appearance so late as to seriously damage the fruit crops. It was the original plan, years since, to plant the land to peaches exclusively, but owing to the early blooming of peaches and the danger of early frost in the past seven years, almost all new orchards have been planted to apples and pears.

The frost continued to put in its appearance still later each year, and since 1906, the last full crop of fruit harvested, including all varieties (though we must except here a small section in the eastern end of the valley, which by nature has been unusually protected by the palisades or perpendicular cliffs rising from the edge of the valley almost perpendicularly to a height of several hundred feet, between the walls of which there is almost constantly a wind blowing), fruit raising has been anything but a money-making proposition.

With bearing fruit orchards with a selling valuation of from $600 to $1,500 per acre, the fruit crop being destroyed by frost, it was necessary by some means to overcome this frost problem and prevent a panic in land prices throughout the valley.

Artificial heat applied to orange groves had been successful in its effects in California, but it had only been necessary there to increase the temperature a degree or so, while here it was important that the temperature should be raised, during these freezing periods, from five to seven degrees, and possibly as much as ten degrees in some few instances. During the spring of 1908, along about the first of March, three growers of the valley secured from California some oil smudge-pots, and using kerosene at a price of fifteen cents per gallon, undertook to fight the frost.

Smoking and smudging the orchards here had been attempted in a crude manner for many seasons in the way of using wood, manure, brush and in fact almost any kind of old rubbish that would burn. It had been customary, just prior to sunrise or about the peep of day, to light these fires, as at this time the fruit suffered most danger owing to the sun thawing out the frost, but if the frost is caused by the thermometer dropping below twenty-eight degrees, heat is necessary, though smoke is helpful.

It was with great interest that the growers throughout the valley watched the experiment of the three orchardists using the oil-heating apparatus in the spring of 1908, and although it was their first attempt, with no former experience, they successfully fought five nights of frost and won, not winning by a scratch, but being safe at all times, and saved their entire crops, consisting of apricots, peaches, plums, pears, apples and cherries. They did great work, and they should be given credit for saving the fruit lands of Grand Valley. These three orchardists were the only ones in the valley, with the exception of the especially protected portion above noted, which, however, suffered considerable damage, that produced the fruit shipped from Grand Valley in the fall of 1908.

It is always remarkable that some people cannot be shown. There were a considerable number in the valley among the growers who attributed the success of these orchards to being in especially favored spots, and these growers, about ten or twelve per cent of the total number of growers, trusted to Providence again this year, and will be repaid for their doubts by losing their fruit crops again.

AN ODD STUNT
Spitzenberg grown to order by Sears & Porter, Hood River, for Cafe Martin, New York

THE ABOVE PICTURE SHOWS THE REMARKABLE TRANSFORMATION FROM SAGE BRUSH TO NURSERY IN SIXTEEN MONTHS
Under the Baker Irrigation Company's project, adjoining Baker City, Oregon

Heating with kerosene was too expensive, for every pot in two or three hours will burn fifteen cents worth of oil. The growers were anxious to get something cheaper. Crude oil was secured this spring at a cost of from four and a half to five cents per gallon. This was found to be even less than one-third of the expense incurred in using kerosene oil. Three quarts of crude oil will burn three hours, making a much hotter and a more steady fire. Oil, however, must be hauled a long distance to reach the growers, as it comes from the eastern slope of the Rockies. No oil is to be had on the western slope.

Owing to this long haul, and the price of oil, while the Grand Valley enjoys a great abundance of coal at hand, the mines being in fact at our very doors, and the price ranging from two to four dollars per ton, during the summer and fall of 1908 numerous tests were made with coal-burning pots. There were more than a dozen different inventions of these pots during this time. These tests proved very satisfactory and by far the larger proportion of the growers of the valley provided themselves with coal-burning pots.

It is estimated that seventy-five per cent of the orchards were protected by either oil or coal pots this season, and saved their entire crop. There will be some fruit, although scattered, in the orchards of those not smudging.

The first heavy frost of this season occurred on the 29th of April, and the temperature fell to twenty degrees above zero. The orchard heaters kept the temperature inside of the orchards during this time at not less than thirty degrees, and in some instances as high as thirty-six, showing that by artificial heat temperature can be held from eight to sixteen degrees above that obtaining where no smudging is being done.

The prevailing type of oil pot, and that is the first pot used in the Grand Valley, is made of sheet iron, and is similar in size and shape to the ordinary lard pail, and made to hold about three quarts of oil. Round holes about half an inch in diameter are cut near the top for ventilation purposes. Covers of sheet iron are always placed at hand near each pot in order that the fire may be smothered out by placing them on the pots when it is no longer necessary to keep them burning. These pots are kept filled with oil in advance. A small piece of rag or waste, floating on the surface of the oil, is used as a wick for lighting. When it becomes necessary to light up, the torch is carried in the hand, and the pots are fired as quickly as the lighter can run from pot to pot. Some of the growers have found it much more desirable, and they claim quicker, to carry with them a bottle of gasoline, sprinkling a few drops over the oil, this instantly igniting the oil on application of the torch. Pots of this design cost about thirty cents each. A hundred pots are used to the acre. It is estimated that the cost of smudging by oil will average throughout a season from fifteen to twenty-five dollars per acre.

Another oil pot, the users of which claim it to be far superior to the one above described, very much resembles the ash pan of the ordinary cooking range, and of about the same dimensions. To this is added a sliding cover. To the cover is attached an apron which extends into the oil. By the sliding of this lid the heat or fire surface can be so regulated as to give from one-half to three times the heating force possessed by the round pot. These pots are somewhat more expensive, that is, the first cost, but require less attention in that they contain oil enough to burn over several nights of light frosts.

We shall not go into detailed description of all the different styles and forms of coal pots used, owing to the vast number, some of which are good, some fair and some bad. One of the best pots used is about ten to twelve inches across, flaring upward and outward in a round shape to a diamond at the top, eighteen to twenty inches. These pots are provided with a cross-grate. About three rows of ventilation holes about the size of a silver dollar are cut out of the sides. It is necessary is using the coal pot to have it covered, allowing a space of about two inches between the pot and the cover for draft. From forty to sixty pots are used to the acre, and a load of twenty pounds of coal will burn about three hours.

It should be understood that while it is a strenuous work, it is by no means a complicated affair, nor should one possessing a small orchard be deterred from protecting it from frosts on account of not having some especial smudge pot at hand. If a fruit grower has the necessary energy it is a simple matter for him to construct some kind of a heating apparatus that will burn coal, or almost any vessel that will hold oil will answer for an oil pot. It is well to caution growers that the temperature should be closely watched, and they should not wait until it has fallen to the danger point, twenty-eight degrees, for it is far easier to hold and raise the temperature if the fires are lit at thirty-two or even thirty degrees. Growers experimenting with smudge pots should be careful not to set the pot too close to the tree, for when the fire reaches its highest point of heat it may damage both tree and fruit. It is not necessary for fruit to be lost even where the temperature drops as low as twenty degrees, and even should the orchard be isolated, for in many instances in the Grand Valley orchards of this kind which were isolated have had equally as good crops as those in more thickly settled communities. Given the lowest temperature to which a country is subjected, figuring on the basis of increase of ten to twelve degrees in heat, one can easily tell whether or not it will pay to attempt smudging.

SEVEN-YEAR-OLD APPLE ORCHARD NEAR PAYETTE, IDAHO

EXPERIMENT STATION RESULTS ON APPLE SCAB

BY F. L. GRIFFIN, ASSISTANT IN PLANT PATHOLOGY, OREGON EXPERIMENT STATION

TO the Editor: Knowing that many of your readers are interested in the work the Oregon experiment station is doing in the Hood River Valley, I submit the following for their consideration.

Two years experimental work with the lime-sulphur solution at the station, having proved its value as a fungicide, especially for the control of apple scab, Professor A. Cordley established demonstration sprayings on a commercial scale at Hood River, the orchard used for this purpose being Allenhurst, Dr. Stanton Allen, proprietor.

The progress of the work has been mentioned in former issues of this paper and all we can say now about the result of this season's work is, lime-sulphur has again demonstrated its fungicidal value by keeping the foliage free from scab. The result of the previous year's work was given in "Better Fruit" and the information will again be available. The point to be emphasized now is the excellent opportunity the apple growers in Hood River Valley have for stamping out apple scab, or at least of bringing it under control.

McINTOSH RED TREE IN FULL BLOOM
The famous apple of the Bitter Root Valley, Montana

Those familiar with the life history of the fungus causing apple scab know that it passes the winter as a saprophyte on the decaying apple leaves, and that these leaves are the source of the spring infestation. It is evident, then, that if every scabby leaf is destroyed between now and spring, there will be no scab next year.

Although climatic conditions this year were rather unfavorable for the development of the fungus, observations which have been made indicate that there are few orchards in this valley that do not contain the fungus on the foliage. This is especially true of the Newtown.

The stamping out or control of the fungus can probably be best accomplished by one of the following methods:

The first and rather costly method is that of raking and burning the leaves after they have fallen from the trees. The second, and probably equally effective method, is to plow the leaves under as deeply as possible.

Either of the above methods will require the concerted action of all the growers, and should be practiced several consecutive years. As such concerted action is not likely to prevail, it will fall to the individual grower to insure his crop by the proper use of fungicides. This can be done most effectively and cheaply by the use of a fall application, followed by one or two spring applications as the leaves are unfolding. If the spring be wet and favorable for the development of the fungus, more applications should be given.

With the beginning of the fall rains the scab colonies that were held more or less in check by the dry summer weather, again become active and spread the infection among the leaves. It is this fall infestation that serves largely to carry the fungus through the winter.

The fall infection can be checked by applying either Bordeaux or lime-sulphur as soon as the fruit is gathered.

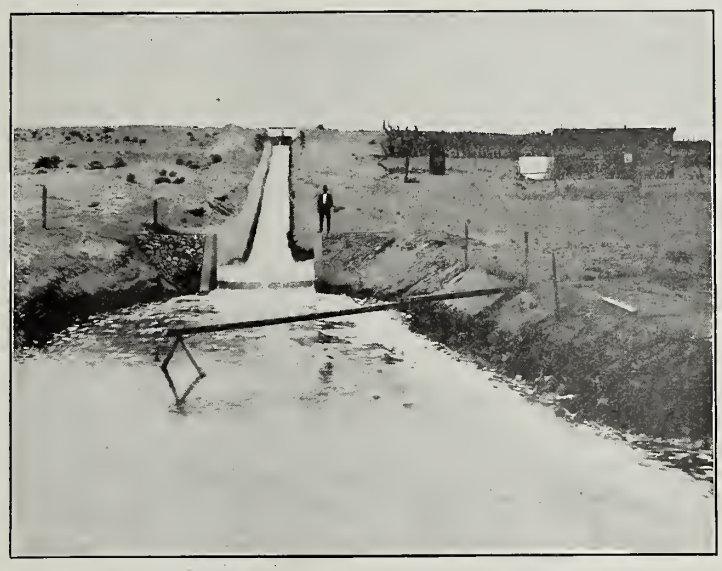
The station has begun the demonstration sprayings for the coming season by using lime-sulphur, diluting the 32 degree Beaume stock solution 1 to 12. This will give a spray testing about 1.04 specific gravity, and which will not only control the scab but will destroy all exposed anthracnose spores and the San Jose scale as well. It should also have a detrimental effect upon the green and brown aphids and their eggs. The use of lime-sulphur for this purpose, however, is still somewhat in the nature of an experiment and we hope to give more definite information next year.

Another point to be investigated the coming year is the time the perfect stage of the apple scab fungus matures. The date the spores are set free and become capable of infesting the young apple leaves in spring probably varies with the locality and season, but if the date can be approximately determined for Hood River Valley it may serve to lessen the work necessary for scab control.

PUMPING OF WATER FOR IRRIGATING PURPOSES

CONTINUED FROM NOVEMBER EDITION. BY R. H. THOMSON, CITY ENGINEER, SEATTLE, WASHINGTON

SUCCESS in obtaining a sufficient water supply from wells in this region depends largely upon their proper development. In developing, the best results are obtained by pumping one well at a time with a powerful engine and centrifugal pump, gradually increasing the speed until all fine material is pumped out and a water-filled cavity of considerable size is formed in the gravel stratum at the bottom of the well.



SECTION OF CONCRETE CANAL, SHOWING GATE AND BY-PASS HERMISTON, OREGON

"My plant consists of a twenty-five to thirty horsepower gasoline engine and an eight-inch centrifugal pump, both of a well known, standard make. The pump is set in about the center of a line of wells and the two lines of suction pipe are connected to pump by an eight-inch tee and check valve. The suction pipe is seven-inch O. D. oil well casing, which extends down each well about forty feet; the pump is set in a pit dug nearly to the water level, and the power is transmitted by a ten-inch rubber belt. Cost of plant, complete, including wells and engine house, is about $2,400, or $20 per acre for the 120 acres it is capable of watering. This plant pumps four second feet or 172,800 cubic feet per day of twelve hours. This waters three to five acres of alfalfa, averaging about four acres per day. We use for fuel, No. 1 distillate, which costs on the ground, just about nine cents per gallon. The engine burns about three gallons per hour, at a cost of twenty-seven cents, or $3 24 per day, or eighty-one cents per acre, if four acres are watered. This equals a fuel cost of about 1.9 cents per 1,000 cubic feet of water pumped, or a little less than eighty-three cents per acre foot. The water level is thirteen feet below the surface, but it is soon lowered, so that the average lift is about thirty feet.

"In this section, the growing of alfalfa by pumping will show a net profit, at present prices, of $30 to $50 per acre above all cost of production.

"In calculating the cost of irrigation pumping, two important factors are often ignored. One is that interest should be reckoned on the money invested, for even if the money is not actually borrowed, the owner of the plant is deprived of the use of that money, and a fair rate of interest should be taken into account. The other factor is, that machinery of any kind depreciates rapidly and a certain amount must be calculated for its renewal. The cost of irrigation by pumping, exclusive of labor, may be classified under four heads, as follows:

"A. Interest on investment and taxes.

"B. Depreciation.

"C. Fuel cost.

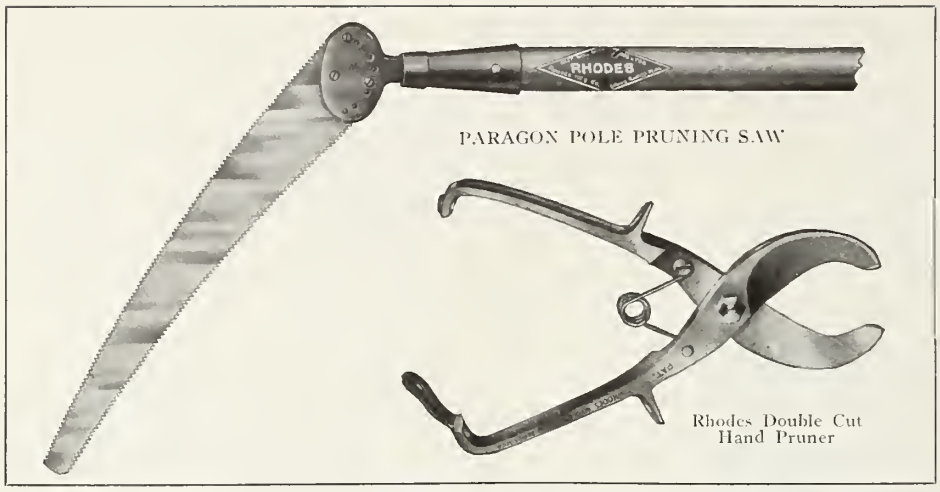
"D. Lubricating oil, waste, battery renewals, electrodes and repairs.

"Frequently, one item of cost only, that of fuel, is considered. In some cases the cost of fuel is much below that of the other items. It is sometimes possible that even if there be no fuel cost, as in the case of pumping by windmills, the cost per acre for irrigation is greater than if an economical engine were used.

"For instance, probably what is the most efficient and economical windmill pumping plant in this valley comprises three units of separate plants, pumping into a common reservoir. Each unit consists of a twelve-foot, back-geared steel mill, and an eight-inch plunger pump, raising water from a ten-inch well, fifty-five feet deep. The water level at this place is eight feet below the surface. This plant waters nine acres of alfalfa and with the exception of an occasional shortage of water in the fall, from lack of wind, is reasonably satisfactory and certainly is profitable. This plant cost $780 complete, including brick lined reservoir, seventy-five feet square and five feet deep. This is a cost of $86.67 per acre for the land irrigated. If it is assumed that fifteen per cent for interest, taxes and depreciation is a fair yearly charge, this being the customary rate, the cost per acre for water is $13 per year, or much higher than by any reasonably economical steam or gasoline pumping plant.

"A plant of moderate size, recently installed in the same vicinity, shows remarkable economy in first cost. The expenditure for a ten-inch well, six-inch pump, and twenty horsepower engine, all complete in place, was little more than $1,000. The owner estimates that this plant will irrigate forty acres of alfalfa. This supposition is probably within the limits of safety. This is about $25 per acre, for installation of outfit, which is far below the average cost. This is a fairly typical plant, a great number of plants of about this size being in successful operation in

WHITE SALMON RESIDENCES, WHITE SALMON VALLEY, WASHINGTON



PARAGON POLE PRUNING SAW

Rhodes Double Cut Hand Pruner

this section. Nearly all of these plants are used for the irrigation of alfalfa only. Probably twenty acres is about the average amount of land watered, but for the purpose of arriving at cost, we will assume that forty acres can be watered. Interest and taxes on the investment will amount to at least seven per cent, and depreciation will amount to at least eight per cent. Fuel cost here ranges from $1.60 to $1.65 per acre for each irrigation of alfalfa. The average for a large number of plants on which this estimate is made is just about $1.00 per acre for each irrigation, or $5.00 per acre per year for five irrigations. Estimating on the basis of five irrigations per season, we have the following:

ANNUAL COST OF PUMP IRRIGATION FOR FORTY ACRES

Cost of plant, $1,000.00

Interest and taxes, at 7 per cent	$ 70.00
Depreciation, at 8 per cent	80.00
Fuel, at $1 each for five waterings	200.00
Incidentals, estimated at 50 cents per acre	20.00
Total cost 40 acres per year, exclusive of labor	$370.00
Cost per acre per year, exclusive of labor	9.25
Cost per acre foot, exclusive of labor	1.81

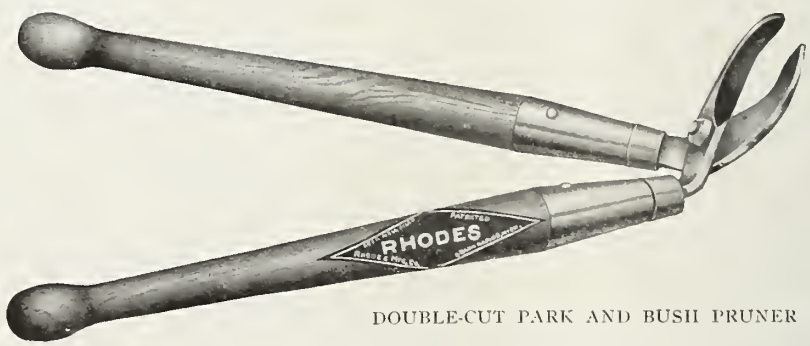
"In comparing the cost to the farmer, of pump irrigation for individual installations, the difference in the cost of labor should be taken into consideration as compared with the cost of irrigating from canals supplied by gravity, or from large central pumping stations. It cannot be expected that one man can irrigate more than three acres per day with a plant of small size, while from a canal system, with the land in proper condition, one man can irrigate from twelve to twenty acres in the same time. It is probable that with the exception of a small area in Southern California, there is no portion of the United States with as many pumping plants as this part of the San Joaquin Valley.

"After an experience of some years, during the nineties in the sale and installation of irrigation pumping machinery, and from my experience and reasonably close observation since that time, I have arrived at the following conclusions: Irrigation pumping, under favorable conditions, is profitable. The distance to which water can be raised depends largely on the class of crops and the price of fuel. Water for orange growing is frequently raised 300 feet, and sometimes even higher. A plant at Exeter, California, is raising water 585 feet for orange growing. Many plants in Southern California are lifting water sixty, eighty, and even one hundred feet for the irrigation of alfalfa. I should say that, as a general rule, sixty feet would be the economical limit here, except where alfalfa brings unusually high prices.

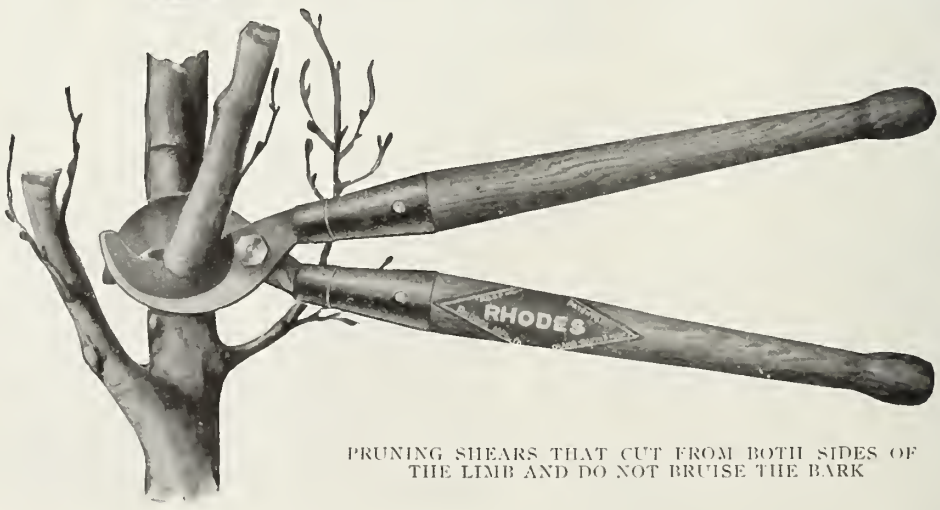
"Where a sufficient supply of water can be obtained at from twenty to forty feet, with a reasonable fuel cost, irrigation pumping can be considered a good business proposition, provided a gravity flow cannot be obtained at a cost within $100 per acre.

"Under California conditions, with distillate at nine cents per gallon and fuel oil at $1.25 per barrel, I would advise the use of steam plants above

DOUBLE-CUT POLE PRUNER



DOUBLE-CUT PARK AND BUSH PRUNER



PRUNING SHEARS THAT CUT FROM BOTH SIDES OF THE LIMB AND DO NOT BRUISE THE BARK

sixty horsepower. In plants below that size distillate is usually preferable."

I have quoted very liberally from the letter of Mr. Woodward, because of my personal knowledge of his long experience and of his systematic method of handling his finances. Especial attention is directed to his figure of $9.25 as the cost of water per acre per year for irrigating in the San Joaquin Valley, exclusive of labor, with a modern pumping plant and a lift of thirty feet, taken in connection with the fact that men consider themselves fortunate if able to secure a farm in this valley and begin life under such circumstances.

There are now being constructed in the State of Washington several pumping plants to be operated by water power. None of these pumping plants have been in operation long enough to justify the announcing of a definite figure, representing the cost per acre foot of water delivered to any given elevation. After a careful examination of the two larger plants, I have framed the following estimate:

Cost of installation, about $30 per acre, taking into consideration the total amount of land subject to irrigation.

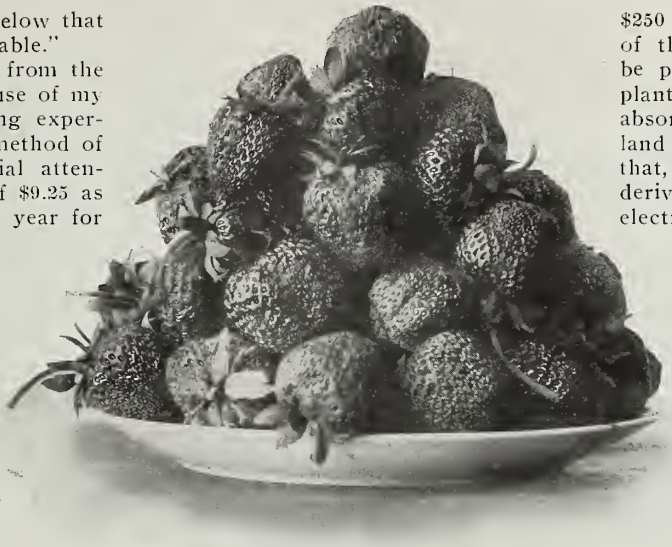
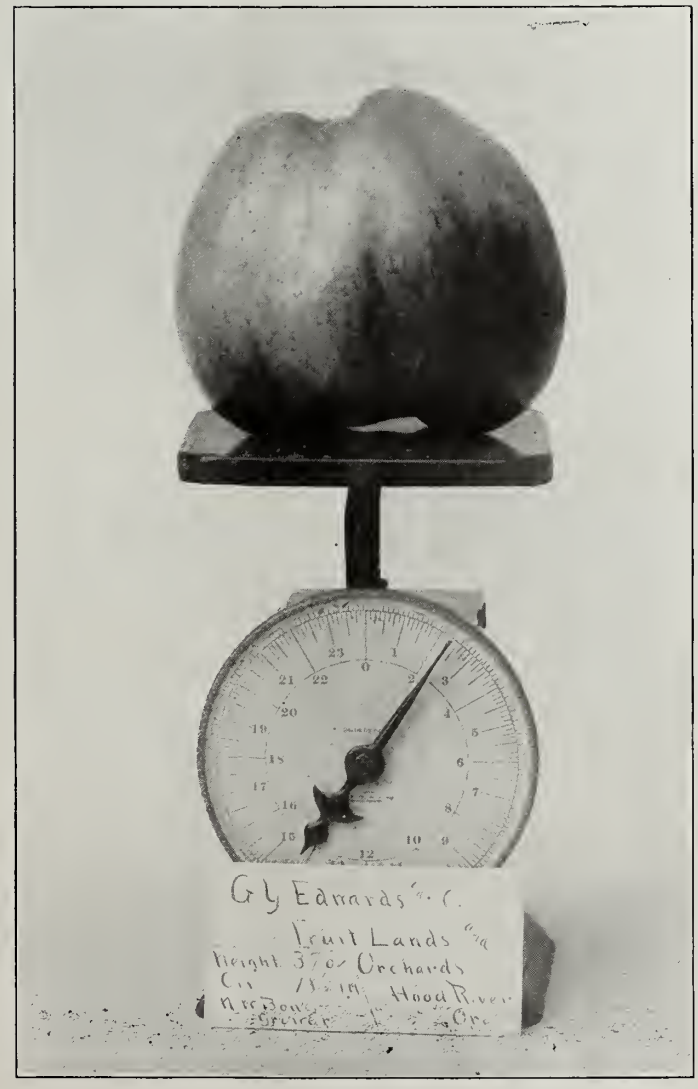


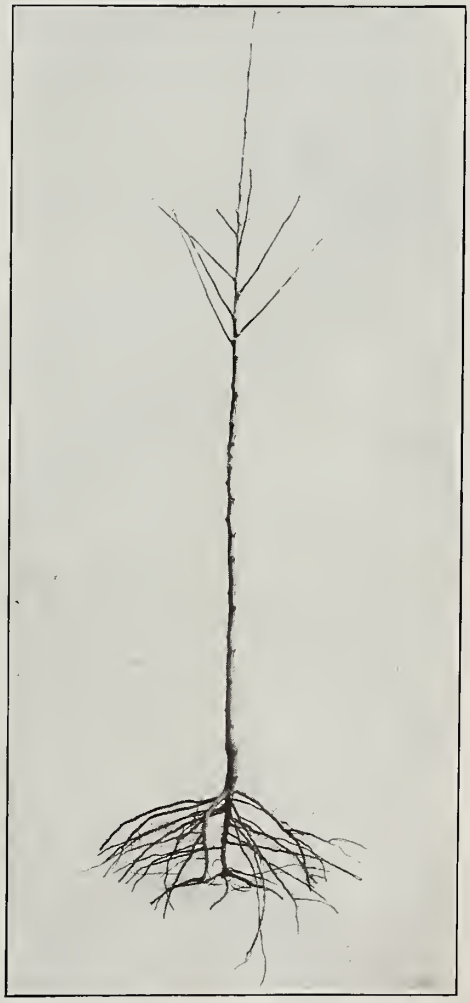
PLATE OF STRAWBERRIES FROM BOISE, IDAHO

Period of time after which plants will be operated at full capacity, about six years; therefore, the average period of time, for which interest and depreciation must be added to original cost per acre, will be three years, making the probable actual cost of plant per acre, when in full service, practically $44.

This would demand an annual charge for interest, taxes and depreciation of $6.60; and for lifts of about 100 feet, and the maintenance of the main canal, I would compute an added cost of about $2.50 per year, making a total required income to be derived from pumping plants operated by water power of about $9.10 per acre year. These hydraulic plants, however, will bring to their owners a very considerable revenue from other sources than irrigation. For instance, the furnishing of electric current for lighting and power purposes, for which purposes practically all of the plant will be free for a period of six months in the year, therefore, these plants are not compelled to look solely to the returns from irrigation for their support. Furthermore, inasmuch as the plants, in each case, belong to companies which have purchased large quantities of land, and have raised the price of that land from $10 per acre to $250 per acre by reason of the presence of the water power pumpage, it is to be presumed that the first cost of the plant is supposed to have been wholly absorbed by the increased price of the land and is now a negligible factor in that, hereafter, owing to the profit to be derived from the economical sale of electricity, that the charge per acre for land lying not more than 100 feet above the level of the water in the ditch need not be in excess of $1.25 per year per acre foot of water furnished, and that the ultimate charge for delivery of the water into the canals of lower elevation may be proportionately less.

From all the data at hand, it is perfectly safe to venture the assertion that a large profit can be made upon fertile lands irrigated by pumping, where such lands are accessible to a good market. The maximum amount which could safely be paid for such irrigation we are not now in a position to state, but it seems to be probable that in any reasonable climate, for fertile lands reasonably accessible to market, an intelligent farmer will have no hesitation in undertaking to cultivate such lands with a charge for water of three dollars per acre foot per year.



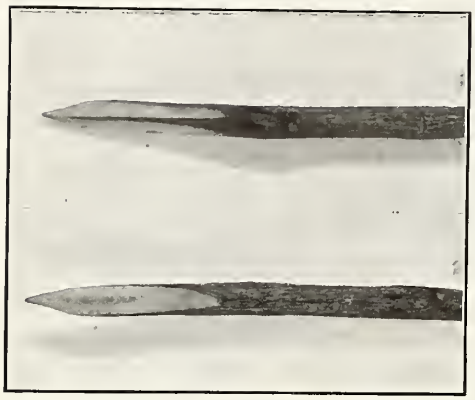


YEARLING NEWTOWN PIPPIN
Measures six feet nine inches, and handsome both as to top and root system. Grown by The Dalles Nursery, The Dalles, Oregon

METHOD OF TOP GRAFTING OLD CHERRY TREES

BY H. H. CROSS, SALEM, OREGON

My method of working over, or top grafting old cherry trees can be employed successfully when the tree is in bloom, as well as at any earlier period, and as proof of what I claim, I can show a cherry tree here in town that I



SCION CUT IN PROPER MANNER FOR TOP-WORKING CHERRY TREES

worked over the latter part of last April, 1908. In working this tree over, I cut off limbs from four to ten inches in diameter, putting in from three to five scions in each limb. The first tree I worked by this method was in the spring of 1898, near the town of Stayton in this county, which was white with bloom when I began work upon it. And since the summer of 1900 it has borne regularly a good crop of cherries each year. I inserted eighty-five scions in the top, and 90 per cent of them grew.

Now, as to the method: First, I cut my scions while perfectly dormant, placing them in a box of sawdust in a cool place, and keeping them dormant. No matter how forward the trees may be, if the scions are dormant, and the work is carefully done, it will prove fairly successful. I enclose a scion cut in the proper manner, of which you can make a cut. The flat side goes next the wood, between the bark and the wood. The two bevels at the back of the scion fit in next the inner bark of the stock. The strip of bark left at center of scion at back, fits in where the bark of stock splits when inserting the wedge to loosen the bark before inserting the scion. The wedge should be triangular in shape, similar to shape of the scion, and should be made of hard, seasoned oak or maple.

Then, when the sap commences to flow in the tree sufficient to loosen the bark, I commence operations. In sawing off the limbs it is necessary to saw in well on the under side, to prevent the limb from splitting, thereby stripping the bark from the limb. Then trim edge of bark smooth with a sharp knife, and insert wedge between the bark and wood to a depth sufficient to insert the scion, so the top of bevel on scion joins bark at top of stock, forcing scion down tightly under the bark. Then wax thoroughly all crevices in bark, especially around scion where it enters beneath the bark. Wax entire surface of stock where cut off, also top end of scion. If this work is well done there is little danger of failure. The two essential points are, perfectly dormant scions and careful work in waxing. I use a wax composed of beeswax, one pound; resin, six pounds; raw linseed oil, one pint; melt, and apply hot, with a brush or swab.

I have been too busy to write this sooner, but it may be of use yet this year, as it lengthens the grafting season at least two months. This method is known as the bark graft, and is well illustrated in Green's Fruit Grower for March, but is not explained. I believe this method may be employed during any month when the sap is flowing, if the scions can be kept dormant.

I hope this may help the cherry growers of Oregon to work over all undesirable trees, instead of grubbing them up.

DO YOU WANT TO SELL YOUR FARM

If so, give me price, description, etc. I want to hear from owner who wishes to sell direct to buyer without paying any agent's commission. There is a good buyer for it, willing to pay your price. I can locate him for you. Not particular about location. Write me at once, giving full particulars, and state when possession can be had, and see if we can close up a deal in short order. *Address*

WILLIAM DUTTENHOFER
1835 Sycamore St. Cincinnati, Ohio

WHITE SALMON VALLEY

The north half of that great fruit belt, of which Hood River is the south half.

Recognized as the home of the Spitzenberg and Newtown apple.

Located on the Spokane, Portland & Seattle Railroad, has splendid shipping facilities, fruit growers' union, beautiful scenery, plenty of pure water, fine climate.

FOR PRICES AND FURTHER INFORMATION WRITE

WHITE SALMON LAND COMPANY White Salmon, Washington

THE CELEBRATED

BITTER ROOT VALLEY

Is the Home of the McIntosh Red

Both for the orchardist and truck gardener it is a country of opportunities, with adaptable soil, good markets, and a mild, pacific climate.

Hamilton, the capital, is a progressive city of 3,000 people, offering many business openings, as well as a residence in the most beautiful valley of Montana. Write right away to the Secretary of the

CHAMBER OF COMMERCE HAMILTON, MONTANA

OREGON

The Portland Commercial Club

Will be pleased to furnish you literature from all points in Oregon, in addition to the most artistic and expensive booklet ever circulated, free of charge. No other subject gets half the attention given to fruit growing in these publications. Write today to

Portland Commercial Club
Portland, Oregon

IS THE PLACE FOR YOU

HIGH-CLASS PERIODICALS PRAISE BETTER FRUIT

Portland Oregonian.

"Better Fruit," a well-known horticultural publication of Hood River, issued for November an Irrigation edition. The number contains a great many articles of value and importance from writers of information and authority. It is profusely illustrated and beautifully printed, and has altogether 104 pages of interesting matter. The editor furnishes an illuminating article on "Prospective Future of the Northwest."

Advertising and Selling.

One of the most interesting of all the pomological journals in the land is "Better Fruit," published by E. H. Shepard at Hood River, Oregon. It is ably edited and handsomely printed. It partakes of the spirit of the place. The Hood River fruit region is notable for the quality of the fruit shipped and for the quality of the fruit growers. It is there that the majority of the fruit raisers are university men, and where there is a flourishing university club among the fruit orchards.

United Publishers' Association.

"Better Fruit," Hood River, Oregon, specializing on one topic, has built up a clientele which reads it with interest and strengthens its qualities as an advertising medium. It has attained a marked position among Pacific Coast periodicals, and its influence is extending eastward. Fruit growers are a generally prosperous class, and this should prove a "good puller" for any commodity in ordinary use.

Collier's Weekly.

In the cozy little Hood River Valley of Oregon, as an instance, where there are probably not more than four hundred orchards all told, there is a university club of one hundred and ten members, one of whom conducts a most attractive and informative monthly magazine known as "Better Fruit," which is devoted to its subject. Worn-out professional people and those also who love the vast peace of the great out-of-doors, and who go West with a little money and much energy, find a haven. Frail men, who have promised their wives to die at forty-five, plant orchards on the slopes of Mounts Adams, Baker, Hood or Shasta, and live until they grow ashamed to stare a cemetery in the face—and they eat shamefully. That which is true of Hood River is also true of the Yakima, Spokane and Touchet Valleys of Washington, of the Rogue River, Umpqua and Willamette Valleys of Oregon, of the Idaho, Montana and Nevada orchard communities, and even more so of the great fruit valleys of California.

Hood River Glacier.

"Better Fruit" has appeared for November in an Irrigation number, and it is the largest issue of that magazine yet published. It contains 104 pages, being nearly thirty pages greater than any previous issue. The cover design is a reproduction of the seal of the recent Irrigation Congress, and numerous well-written articles on irrigation, profusely illustrated, are contained in this special number. This magazine is fast branching out and is growing rapidly. C. R. Greisen leaves the last of the week to represent "Better Fruit" at the National Apple Show in Spokane, and from there he will go directly to Chicago to work in the interests of the publication at the Land and Irrigation Exposition. Later he will make the meeting of the State Horticultural Society in Portland, and in January Mr. Greisen will go to Denver for the big apple show there.

Yakima Herald.

"Better Fruit" for November contains 104 pages of information, illustration and advertising, and deals almost entirely in its subject matter with Washington, Oregon and Idaho, and particularly with the horticultural activities of those states. It is an "Irrigation Edition" and as such is practically qualified to become a text book. The subject

Rae & Hatfield

Largest Handlers of Pacific Coast Fruits in the East

REPRESENTING THE FOREMOST WESTERN SHIPPING COMPANIES AND ASSOCIATIONS ON THE NEW YORK MARKET

Operating in All Producing Sections

Reliable **Experienced** **Prompt**

317 WASHINGTON STREET NEW YORK

Gibson Fruit Company

Not Incorporated

131 SOUTH WATER STREET CHICAGO, ILLINOIS

Great Central Market

We specialize in fancy Pacific Coast and Northwestern fruit. We are general distributing and Eastern marketing agents for some of the largest associations and shippers in the Northwest. We make a specialty of selling f. o. b. in transit or delivered, whichever way will realize best results for the shipper.

If you have not already arranged for the disposition of your shipments, make us your general Eastern sales agents. Will give your business special attention.

Mr. W. C. Michael, our Northwestern representative, is well known to a large number of the shippers of that section, and will be glad to call and see you during the season.

We own our own cold storage plant, the only one on South Water Street. It is an up-to-date one with a capacity for one hundred thousand boxes of apples. This, in connection with our store, places us in the best position of any one in the fruit business to protect the interests of the shippers.

We refer you to The First National Bank, Chicago, The Chicago Packer *and the* Produce Reporter Company

OLDEST LIVERY COMPANY IN THE VALLEY

TRANSFER & LIVERY CO.

Special attention to commercial men, camping & fishing parties

TELEPHONE MAIN 131

HOOD RIVER, OREGON

is treated from a variety of standpoints, all intensely practical in their method of handling and all profusely explained by the numerous illustrations. References, particularly in the pictures, to the Yakima Valley are numerous. Among the subjects discussed in the magazine are "Measurement of Water by Means of Meter," "Government Reclamation Projects," "The Reclamation of the American Desert," "Oregon's Law Controlling Water Resources," "Irrigation Situation in State of Washington," "The Duty of Water—Its Economical Handling," "The Horticultural Possibilities of Idaho," "Pumping of Water for Irrigation Purposes," "The Call of the West," which is from the pen of the late Governor Johnson of Minnesota, and "The Prune Growing Industry in Idaho." It is, however, by "Better Fruit" itself that the best tribute is paid to the horticultural possibilities of the Northwest. A fruit-growing community which has developed to such proportions that it can own and maintain such a publication as that in question, indicates by the magazine itself the very prosperity and potentialities that it attempts to preach. Mechanically and otherwise the publication is apparently perfect—and it is home-made. A section that can claim such a high class magazine devoted to a special interest need make no further claims in behalf of that special interest.

A Trip to the Coast

Is incomplete without a ride on the

Mt. Hood Railroad

By Mountain Streams, Virgin Forests, Apple Orchards and Snow Capped Peaks

Connects with O. R. & N. at Hood River, Oregon

Bitter Root Valley

ORCHARD LANDS

FOR

HOMESEEKER, NON-RESIDENT AND INVESTOR

ADDRESS ALL CORRESPONDENCE TO

JAMES F. TORRENCE Hamilton, Montana

FRUIT FARM FOR SALE

Will sell my 80-acre fruit farm, located 2½ miles from Jefferson or 12½ miles from Salem, Oregon. Has 20 acres in prunes, with 10 acres in bearing; 15 acres of English walnuts 14 years old, 20 acres sea to Spitzenberg apples, and will plant 7 acres of Baldwins, 7 acres of Pippins and 4 acres to Comice pears yet this fall. This farm is well fenced, on main road, handy to good school and in a good and pleasant neighborhood. My price is $250 per acre. Reason for selling, cannot be there to look after it.

For full particulars write or call on MELVIN HANSEN, Owner, 14 East Eighth Street, Eugene, Oregon

Newtowns Yield $1800 per Acre

James Lacey on an acre of Newtowns marketed 791 boxes of first grade apples, which brought $1,698.55. He has left fifty boxes of seconds, which will sell for about $1.50 per box, and bring the total gross sales from one acre of Newtowns up to $1,800. The returns from his three and a half acres of bearing apples, all kinds, are $3,801.76 for first grade apples alone, and second grades will fully pay for the labor of taking care of the crop. This makes an average of over $1,000 an acre profit.

Live facts in a lively way. Live facts for men and women
Facts that affect you—your family

HOOD RIVER VALLEY

APPLE LANDS

Hood River Orchard in Bloom, Giving Promise of Golden Returns

Fancy Hood River Apple Pack

AGENTS FOR MOUNT HOOD RAILROAD COMPANY
LOGGED OFF LANDS IN UPPER HOOD RIVER VALLEY

Many started in a small way; today they are independent
You can begin today. It pays to see us
He who investigates for himself becomes "the man who knows"

W. J. BAKER & CO.

HOOD RIVER, OREGON

The oldest Real Estate Firm in Hood River
First class Apple Land our specialty

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of
The Northwest Fruit Growers' Association

A Monthly Illustrated Magazine
Published in the Interest of Modern
Fruit Growing and Marketing

All Communications Should Be Addressed and
Remittances Made Payable to

Better Fruit Publishing Company

E. H. SHEPARD — Editor and Publisher
C. R. GREISEN — Traveling Representative

SUBSCRIPTION PRICE $1.00 PER YEAR
In Advance in United States and Canada

Foreign Subscriptions, *Including Postage*, $1.50
Advertising Rates on Application

Entered as second-class matter December 27, 1906, at the Post Office at Hood River, Oregon, under Act of Congress of March 3, 1879

THE average fruit growers' journal contains a great many departments and consequently only a small amount of space occupied in the twenty-four pages is devoted to the fruit industry. The November number of "Better Fruit" contained one hundred and four pages, almost four and a half times as much in this one issue as you get in the average horticultural paper of twenty-four pages. Many horticultural papers only publish sixteen pages. This again is divided up into several departments. The November edition of "Better Fruit" contained six and a half times as much and all good and interesting. In other words, you get as much in one number of "Better Fruit," and more valuable information in one month, than you get in six and a half months from the sixteen-page paper for which many charge one dollar per year.

◈ ◈ ◈

THE biggest edition we ever saw published by any other fruit growers' paper was seventy-two pages. Most of the editions during the year were of about twenty-four pages. "Better Fruit" during the year has been publishing regularly sixty pages per month, one month producing seventy-two pages, one month seventy-six, another one hundred and four and another eighty-four pages. "Better Fruit" has averaged sixty-six pages per month during the year 1909. What more do you want for one dollar and where can you get it?

◈ ◈ ◈

BETTER FRUIT subscribers have been secured on true merit, are all paid in advance, and obtained without premium and without agents. People take "Better Fruit" because they value it more highly than any other fruit growers' paper published in the wide, wide world. We have some splendid plans for the year 1910 which will even further improve "Better Fruit," but we are not going to tell you about them now because it is not good business to do so. We have frequently found that where we have planned something special, new, valuable and original, and have given it out in advance, somebody gets gay and makes an attempt at a scoop. We cannot prevent this, and have never found any way to prevent our articles being copied and our illustrations being duplicated without credit. To prevent this being done, where we have had photographs taken for illustrations we have bought the negatives, but this does not stop the appropriation of our articles. Our illustrations are photographed and cuts reproduced. We don't like this.

◈ ◈ ◈

IT AFFORDS us pleasure to say that the October edition of the Washington Fruit Grower was in our opinion the most interesting number that they have ever produced. It is well worth reading, and no fruit grower is making a mistake who supports a paper conducted along clean lines like this.

◈ ◈ ◈

THIS edition we have seen fit to call the Planting and Pruning Special, because it contains many good articles on the subject. We regret that our purse is limited, therefore our space is limited, and we are not able to publish all of the good articles that we have received on the above subjects in this edition, even if we have decided to make it eighty-four pages, our regular edition being sixty, and we regret, furthermore, that we will be compelled to continue some of the articles in this issue, concluding them in the January number. Some excellent articles on orchard heating, frost prevention, etc., that we had planned to publish in this edition we have been compelled to hold up on account of lack of space until January. The January number will be a splendid one and continued articles appearing in this number will be completed, and if you want to get in on the good things that will follow the balance of the year send in your subscription if you are not already a subscriber.

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NOVEMBER was the first grand Irrigation number ever produced by "Better Fruit." Future editions from time to time will contain good articles on irrigation, which will make the paper additionally interesting to a large percentage of our readers who are fruit growers. This subject is entitled to a great deal of consideration and it is the opinion of a great many that it is the one feature of fruit growing that we least understand. Too little water is bad. Too much is also bad. It seems strange to a great many, nevertheless it is true. Up to a certain amount of water, clover and alfalfa will increase in quantity; beyond a necessary amount the yield will be decreased. Too frequent applications are by many considered detrimental. We would like growers who have had experience along these lines to contribute short articles on this subject from five hundred to a thousand words in length.

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INDIVIDUALITY OF TREES.—The fact that some trees of certain varieties seem to bear regularly every year is one of which many orchardists are aware. Some trees bear better than others of the same variety in the same orchard under apparently the same conditions. This subject presents much thought and is entitled to a great deal of serious consideration. It is claimed by many that budding or grafting from regularly bearing trees tends to produce a tree of the same habits. The subject is entitled to close observation and study and we hope

Portland, Oregon, November 10.
Mr. E. H. Shepard, Hood River.

Dear Mr. Shepard: Personally, I value "Better Fruit" very highly, and I also think it is "the best fruit growers' paper published in the wide wide world." I congratulate you on the success you have had in building up the paper to its present proportions. You are doing splendid work in helping to creditably advertise and build up this entire section, and richly deserve all the success that can come to you in the way of increasing business and greatly enlarged number of readers.

Sincerely yours,
C. A. MORDEN.

Note—Mr. Morden is the business manager of the Oregonian and owns an orchard at Mosier, Oregon, near Hood River.

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that our readers will take up the matter more seriously than they have in the past. We will be pleased to receive articles of from five hundred to a thousand words on this subject, giving experiences, and will publish the best of such articles that may be sent to us.

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J. H. HALE, fruit grower: "New England can produce as beautiful apples as grow in the West, and can grow even better apples. We have the soil, we have the climate, and, better than all that, we have the market—New England has the market. This is a beautiful Western apple, and it cost $300 a car to get that to the Boston market. This is a New England apple just as good, and the consumer os ready to drive to the orchard and take it away, and if he does not come and get it you would only have to pay $40 a car to get it into the hands of almost one-half the population of the United States. That ought to appeal to Yankees. That is business. The land is here, the opportunity is here, and the man with faith is all that is needed."

Our Answer: Perhaps; but if you can grow better apples in New England than can be grown in the Northwest, why have you not done it? Why do you not get the price? You have been at it for approximately four hundred years. We of the Northwest have only been in the business of shipping apples to Eastern and European markets for about twenty years. Are you justified in claiming it is the man and not the country? Remember, we of the West are from the East. Many of us were born in New England; others have New England blood in their veins. We have the same religious faiths that you have. We are of the same political ideas. We are one and the same people; therefore we certainly cannot make any claim to being more industrious or smarter or better educated than New England people. You must concede this. You know that many of us have come from New England to the Northwest and are getting rich in growing apples. It is not the individual. It is the climate and the soil. We are but human. It is nature that produces the fine apple. No matter how expert a horticulturist a man might be, he cannot grow the finest fruit where the climate and soil are not suitable.

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SPOKANE, WASHINGTON

WESTERN MONTANA APPLE SHOW—GREAT SUCCESS

HELD AT MISSOULA, OCTOBER 18 TO 23, 1909

IF EVER anything was entitled to be termed a great success it was the opening of the Western Montana Apple Show, the first exhibit of its kind in Missoula. Senator Robert M. La Follette formally opened the show, speaking briefly but earnestly to people who appreciated his open-eyed amazement when he first saw the fruits of a state that he had been wont to regard as a mining camp and a cattle range. The display was as magnificent as the surprise of the senator from Wisconsin was complete. Senator La Follette said:

"I have been in Montana nearly a week, and I believe I've caught something of the spirit of Montana." Mr. La Follette began, after he had addressed his audience as "fellow boosters." "Born in one of the states of the old Northwest, just after it had crossed the threshold of statehood, naturally I take a good deal of interest in the upbuilding of a commonwealth in this part of our country. This isn't my first trip to Montana, but I'm free to confess that, when on the extreme eastern edge of your state I received a telegram suggesting that I open an apple show at Missoula, I wondered if I were not up against one of those 'hop-cat' games; if Joe Dixon were not playing a joke on me. I was inclined to be skeptical about the possibility of my opening an apple show here. I am astounded. When I first entered this enclosure I wondered if you hadn't imported some of this fruit from Wisconsin and Michigan, but some good fellows, whose faces are proof of their honesty, have already assured me that it was all grown here."

With a plea for the upbringing of honest men and women, Senator La Follette ended his brief address and the apple show was formally open.

A monster canvas housed the show of apples, pears, plums, grapes and cherries, supplemented by an elaborate exhibit of vegetables and grains. It was a big tent, but not a bit too large for the exhibit. At the entrance the visitor obtained a comprehensive view of the show in its entirety. On his left he saw a solid bank of apples, packed in boxes, the entire length of the tent, with the splendid exhibit of the Bitter Root Valley first in order. And apples and fruit followed the visitor back to the entrance, only on the west side the displays were

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Automobile service daily for Cloud Cap Inn during months of July, August and September

on long tables and plates. Every sort of apple grown in Western Montana was on exhibit, with the regal hue of the McIntosh Red predominating.

Directly in front of the entrance was a pyramid table loaded with the Hamilton Chamber of Commerce's exhibit. On the south wall hung E. S. Paxton's celebrated painting, "Custer's Last Fight." In the center of the tent was the display of grains and vegetables. There were cabbages of great size, beets, pumpkins, squashes, potatoes and celery.

The playing of the orchestra was an enjoyable feature.

C. R. Greisen, business manager of "Better Fruit," a Hood River publication devoted to the commercial fruit business, judged the vegetable exhibits. Mr. Greisen was assisted by M. L. Dean, state horticultural inspector at large and superintendent of the show. Mr. Greisen is an authority on horticultural matters, and his awards met with general approbation. In the evening of the second day Director F. B. Lienfieles, of the state experiment station at Bozeman, delivered an address.

The judging of the fruit displays and exhibits was the most important feature of the third day of the Western Montana Apple Show. The decisions of Judge H. E. Van Deman were received with interest. Judge Van Deman, coming from the fruit exhibits of the Alaska-Yukon-Pacific Exposition, was enthusiastic in his commendation of the local show and in his comments on the wonderful showing made by Western Mon-

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IN CASES OF DYSPEPSIA, RHEUMATISM, GOUT AND NERVOUS BREAKDOWN IS MARVELOUS

Upon recent investigation by eminent physicians, chemists and scientists it has been demonstrated that natural, earth-flowing, mineral waters are the most beneficial means for the cure of organic maladies.

Paso Robles Springs are at this time the point of interest to most investigators, as recent occurrences have attracted the attention of the thinking world to these springs.

One of their chief points of interest to medical men is said to be that which proves that a pre-eminent chemical action rests in the waters which flow from the earth at Paso Robles, California. These waters are superior to those of Carlsbad, Baden Baden and Kissinger in Europe, and come from the earth in natural hot and cold springs.

Paso Robles is making cures daily of rheumatism, gout, stomach trouble, neurotic diseases, kidney trouble and general breakdown, which proves almost beyond question of doubt to medical men that there is some quality in these waters superior to any in this country and probably in the world.

It is also claimed for Paso Robles that the air conditions are perfect. It lies in a small valley protected by mountain ranges; is 720 feet above sea level, and is not assailed by too much sea moisture or an abnormal temperature from the hot land winds.

This air condition is thought by some to have almost as much to do with its cures as the waters themselves.

Men and women from all over the world are daily visiting Paso Robles. They represent the rich and the poor, in fact, there is no quality of mankind not represented among the pilgrims to these waters.

The town, like all health resorts, is filled with boarding houses of all kinds, so that every purse will be pleased. There are hotels for the rich, where any luxury may be had. Private baths for exclusive patrons who wish to be to themselves.

These springs have been known for centuries, for they were used by the Indians to cure their sick, and later the Franciscan fathers performed wonderful cures here, but it is only recently that the really marvellous powers of these waters were made known to the world at large.

Each day brings sick people unable to assist themselves, and every train takes persons away who are cured of maladies which, when they came to Paso Robles Springs, were called incurable.

Every known form of organic trouble is successfully treated at these springs, for the town authorities welcome all except those who have tuberculosis or unclean diseases. For the man who suffers from overeating or from alcoholic excesses there is nothing in the world to equal a week spent at Paso Robles. It straightens him out with a rapidity that is wonderful, and the best recommendation is that they do away with the nerve-craving for stimulants, because of their peculiar soothing effects upon the nervous system. To this reason alone is attributable their great reputation and success as a place for the cure of all nervous diseases of women.

Truly speaking, the study of Paso Robles Springs is one which is giving the medical fraternity abroad and at home much interest and is probably directing more attention to California than any other of her natural gifts to man.

For more complete information address

WM. M'MURRAY, General Passenger Agent of O. R. & N. Co. and S. P. Co., Lines in Oregon, Portland, Oregon

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tana. The unerring accuracy of his judgments stamped him as an expert.

C. R. Greisen, who judged the vegetables, said that all fruit men could learn a lot by visiting the local show, especially as far as packing methods are concerned.

Governor Edwin L. Norris, Attorney General A. J. Galen and Secretary of State A. N. Yoder were guests at the apple show and were enthusiastic in their praise.

H. E. Van Deman lectured before an interested audience. He chose as his subject, "Horticultural Possibilities of the Northwest."

"In the opening of my subject I must first refer to the vast difference in the climate and conditions in the Northwest to that of the Eastern and older fruit growing states. So different in fact are these conditions that in many instances the same varieties of fruit grown here would hardly be recognized by name in the East. However, there is much in this to your advantage. You are particularly favored by soil and climate for the growing of the king of all fruits, the apple. While you should be thankful for this favor, you should not overlook your duty to improve the natural opportunity and grow the apple to its highest state of perfection.

"There are a few principles underlying the growing of fruit successfully which every man must learn for himself. As I stated in my talk this afternoon, there is an ideal which must be set up and worked for through a concerted action, and this ideal must be high. Make home fruit growing your first effort and then look to the commercial side.

"Commercial apple growing must mean to you finally just what prize apple growing for such an exhibition as this has been. You must aim to grow to a height of perfection, as they can be grown here, before you can expect success. The box of commercial apples which will not score 90 per cent perfect is no better for market than it is for exhibition.

"I am more than gratified to find that your orchards in this district are by comparison practically free from disease and pests. This is a great blessing which I doubt if you fully appreciate. But let me impress it upon you to use

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your spraying machine right now just as regularly and faithfully as you do your plow. Only by this continual fight can you preserve this clean condition. Spraying requires an intelligent knowledge, but you have at hand your state inspector and his deputies and your experiment stations, and you should let these serve you.

"I have seen Montana fruits outside the state," said he in closing, "and have heard considerable about Western Montana, too, but never before have had the opportunity of visiting you. I have been through some of your orchards and have critically examined this exhibit, and am delighted and pleased with what I have seen. I have enjoyed meeting many of you and hope to hear that you are prospering and to see you again in the years to come. You have here a very creditable exhibition," he said, "and I must say that the variety shown here is much larger than I had really expected. It shows what you have done in a new country, and your show will help me in my talk to you. I wish to show what constitutes the highest state of perfection of the several varieties best adapted to your climate."

Then Mr. Van Deman explained the marking and scoring of apples, using the card he had prepared for the Seattle Exposition and the Missoula show. Taking one hundred as meaning perfection, he explained his system as follows:

"First comes form. You must learn to recognize any variety in its most perfect form. You have a distinct form in the West, which differs some from the Eastern grades. Form on my card counts ten points.

"Second comes size. It is everywhere recognized that the three and one-half to four tier apples are the most desirable and of the most commercial value. This counts fifteen points.

"Third is color. This counts as much as anything. People buy with their eyes and want the highly colored apple. Of all the colors the red apple, for which this part of Montana is noted, is the best color. This counts fifteen points.

"Fourth comes uniformity. This feature means a great deal, especially when packing is considered. It is very necessary. Takes fifteen points when perfect.

"Freedom from blemish is fifth. I would burn this into your minds, and while I am happy to find your fruit practically free from pests, a blessing which is not fully appreciated here I am afraid, still there are other blemishes which come from careless picking and packing which must be eliminated. Freedom from blemishes scores twenty points.

"Last, but most important of all, comes quality. An apple may be ever so fine looking and perfect in size, and yet if it is not good to eat it will not make a success. Quality counts twenty-five points in the scoring."

Diplomas for fruits and vegetables exhibited but not entered for competition, were given to the chamber of commerce of Hamilton, and the Bitter Root Irrigation Company, also of Hamilton.

In conclusion, "Better Fruit" congratulates President Dorman and Secretary Erfert, and members of the board of directors on the great success of this first apple show of Western Montana.

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FROM YAKIMA REPUBLIC

Inasmuch as pack plays almost as important a part as quality in the superiority of the Western apple, the following on apple packing is interesting. "Better Fruit," the well-known fruit magazine, says the old style pack of straight four-tier, and in fact all straight packs, are giving way to the diagonal pack, which seems to give better satisfaction in shipping, as the fruit does not bruise so easily. With the old style straight pack, where one apple rests entirely on the one below it, if the pack is the least bit high, when the cover is put on every apple will be more or less bruised, while with the improved methods of the diagonal pack no one apple rests on another, but cushions in between the four apples below, so the loss from bruises from the last-named pack is small compared with the other. Some growers believe that in time the old straight pack will be entirely abandoned.

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New York—Jackson Perkins Company, Newark; McHutchinson & Co., New York; Vredenberg & Co., Rochester.

Tennessee—J. W. Shadow, Winchester; Southern Nursery Company, Winchester.

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What contrivance can be used to prevent a drag harrow from skidding on sloping ground? My land slopes from north to south and in harrowing from east to west it is only by the exercise of the greatest care that the harrow can be prevented from bruising the trees.

Is there any chemical compound that will rot out tree stumps? I have two stumps that cannot be blasted out, as they are too close to the house.
Agricola.

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Strengthens and invigorates all soils. You cannot afford to be without it.
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SELECT YOUR

Below we list in brief some of the Fruit Trees and Vines contained in our this season's stock. This does not show our complete line, but represents a collection of the best standard varieties. The descriptions given in this announcement are necessarily in an abbreviated form.

SELECTED STOCK. Our long experience as fruit growers, fruit shippers and nurserymen enable us to determine what varieties of fruit are best to ship, best to grow; best from a seller's standpoint and best from a grower's standpoint, and in propagating we cut our buds and scions only from parent trees that are the best specimens of their kind for productiveness and quality of fruit.

THRIFTY AND EXCEPTIONALLY HARDY. We grow our trees only on virgin soil, never cropping the same land a second time. Our decomposed granite soils produce exceptionally well meshed root systems and bright, highly colored, well toughened wood fiber, thus producing a tree more hardy and one that will bear transplanting better than trees grown on river bottom soils, such as commonly used by nurserymen.

THE BEST COMMERCIAL VARIETIES

APPLES

All Varieties	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.35	$2.50	$20.00	$150.00
3 to 4 feet	.30	1.75	10.00	85.00
2 to 3 feet	.25	1.50	8.50	75.00

Yellow Transparent, yellow, flesh white, an excellent early variety, June.
Early Harvest, good for eating or cooking, last of June.
Red June, abundant bearer, June.
Red Astrachan, large, fine eating, excellent for dessert, the main reliance for an early apple, July.
White Astrachan, very large, fine for cooking, July 15.
Gravenstein, large, skin yellow, fine flavor, the best apple of the summer season, August and September.
Alexander, large, cooking, a profitable variety, August 15 to September 15.
Arkansas Black, November to March.
Baldwin, a fine winter apple, November to January.
Ben Davis, very prolific, November to January.
Grimes Golden Pippin, fine quality, a good keeper, December to March.
Jonathan, good for table or market, November to January.
Mammoth Black Twig, good size, November to March.
Missouri Pippin, good market variety, November to March.
Ramba, medium to large, November to December.
Rhode Island Greening, an old standard, October to January.
Spitzenberg, the best and most profitable winter variety, November to April.
Winesap, one of the best standard varieties, November to February.
Yellow Newtown Pippin, a wonderful keeper, fine quality, very profitable, October to May.

CRAB APPLES

Red Siberian and *Yellow Transcendent.*

PEARS

All Varieties	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.40	$3.00	$22.50	$175.00
3 to 4 feet	.35	2.50	17.50	125.00
2 to 3 feet	.25	1.75	10.00	85.00

Bartlett, the king of pears, a great money-maker; we recommend for extensive planting; July 1 to September 15.
Beurre Clairgeau, prolific, good quality, August 1 to September 15.
Dayenne de Camice, a fine fall pear and very profitable for some localities, October 15 to November 15.
Winter Nelis, profitable variety, September to October.
P. Barry, valuable winter pear, October to January.
Glout Mareau, good variety, fine flavor, large, October to January.
Easter Beurre, good keeper, very large, splendid for dessert, October to March.

PEACHES

All Varieties excepting Fay Elberta	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.35	$2.50	$15.00	$125.00
3 to 4 feet	.30	2.00	12.50	100.00
2 to 3 feet	.25	1.50	10.00	85.00

Fay Elberta in dormant bud, $1.00 each; $50.00 per 100.

FREESTONE VARIETIES

Alexander, profitable on account of early bearing, June 8 to 20.
Triumph, the first yellow peach, the best of the early peaches, and planted extensively by ourselves, June 12 to 30.
St. John, profitable early yellow freestone, June 28 to July 15.
Early Crawford, standard profitable variety, July 10 to 27.
Faster, good for canning, drying or shipping, July 15 to 31.
Elberta, a fine peach, good for canning or drying, excellent shipper, the standard midsummer variety, planted extensively by ourselves, July 21 to August 6.
Fay Elberta, an improved Elberta, Its firm, fine grained texture makes it superior to Muir or Lovell for canning, and also an improvement over Elberta for its shipping quality, being as productive and regular in bearing as the Elberta and better than any peach. Now the most desirable midsummer peach for all purposes. We plant them extensively ourselves and we heartily recommend this variety. Canned, it does not rag out. July 31 to August 20.
Late Crawford, an old standard, July 24 to August 13.
Susquehanna, an old standard, July 22 to August 15.
Muir, a splendid drying and canning freestone, July 27 to August 15.
Lavell, prolific, good for shipping, drying or canning, August 5 to 20.
Picquett's Late, regular bearer, good all-round peach, August 15 to 25.
Salway, the best late peach, August 25 to September 15.

CLINGSTONE VARIETIES

Tuscan Cling, early, prized by canners, July 13 to 27.
Runyan's Orange Cling, splendid for canning, August 5 to 20.
Phillips Cling, the best for canning, August 26 to September 15.
Levi, good bearer, good for Eastern shipment, desirable for canning, September 2 to 25.

PLUMS

All Varieties excepting Santa Rasa	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.40	$3.00	$22.50	$175.00
3 to 4 feet	.35	2.50	17.50	125.00
2 to 3 feet	.25	1.75	10.00	85.00

Santa Rosa, $1.00 each for 1-year-old trees.
Clyman, earliest plum for distant shipping, June 3 to 17.
Tragedy, good money-maker for some sections, a fine plum, June 10 to 17.
Climax, Burbank's king of early plums; planted extensively by us and recommended as best early plum for profit; June 15 to July 3.
Santa Rasa, best of Burbank's recent creations, June 25 to July 15.
Burbank, good, profitable and prolific, June 28 to July 15.
Wicksan, a good variety, July 10 to 25.
Green Gage, fine flavor, good canner, July 10 to 20.
Kelsey, a profitable shipper, July 20 to August 10.
Sugar Prune, good for shipping or drying, July 20 to August 5.
Bradshaw, old standard, profitable, July 10 to 25.
Imperial Prune, strong and productive, valuable drying variety, July 25 to August 5.
Diamand, vigorous grower, very productive; planted extensively by ourselves; very profitable and one of the best midsummer plums for Eastern shipment; July 15 to August 5.
Jefferson, good for canning, August 1 to 15.
Fallenburg, a fine late variety, August 1 to 15.
German, a standard, late shipper, August 15 to September 1.
Yellow Egg, good for canning, drying and Eastern shipment, August 1 to 10.
Giant, splendid Eastern shipper, August 1 to 15.
Grand Duke, a fine large plum and profitable, planted extensively by ourselves, August 10 to 20.
French Prune, the standard for drying, August 25 to September 15.

APRICOTS

All Varieties	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.40	$3.00	$25.00	$200.00
3 to 4 feet	.35	2.50	20.00	150.00
2 to 3 feet	.25	1.75	10.00	85.00

Royal, splendid for drying and shipping, June 1 to 20.
Blenheim, prolific bearer, highly prized by canners, fine quality, good dryer and good shipper, June 15 to 30.
Rautier's Peach Apricot, June 20 to 30.
Tilton, a late bloomer, fine quality and good bearer, June 15 to 30.
Hemiskirk, very hardy, regular bearer, June 20 to 30.
Moorpark, a fine large 'cot, June 25 to July 10.

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Nursery Department
Silva-Bergtholdt Co.
133 Orchard St., Newcastle, California

Gentlemen: Please send me by mail your free catalogue and suggestions to planters.

Name .....

Address .....

OUR CATALOGUE is more than a catalogue in one sense of the word, for the reason that, besides listing all the Fruit Trees, Vines, etc., that we sell, it contains many valuable hints on The Time to Plant; How to Plant; Cultivation; Common Fruit Pests and Their Treatment, as well as the necessary remedial solutions and formulas for the purpose. We shall be glad to mail this catalogue free to all who wish, whether they intend to purchase or not. Write today; the information it contains may save you many dollars.

OUR PRICES are reasonable. Though they may not be the cheapest, yet the cheapest is not always the best.

OUR TREES are the best that care in selection and growing can produce.

FRUIT TREES NOW

TREES TRUE TO NAME. The SILVA-BERGTHOLDT CO. NEWCASTLE, CALIF. PLACER NURSERIES

Our catalogue gives full details concerning each variety, together with our personal observations and recommendations. The dates given after descriptions are the period of ripening. We are selling out fast in some varieties.

TRUE TO NAME. All buds and scions are cut by our nursery foreman from trees that have been under his personal observation and that are marked for this purpose when they are in fruit, and we exercise every care known to avoid the possibility of an error. You can rely that our stock is not only true to name, but is propagated from the best of its kind.

ORDER NOW. Do not wait until you are ready to plant before making your selection. Order now and thus be assured of just the varieties you desire. We are selling out fast in the most desirable varieties, so do not delay. Give the matter careful thought and consider what is best suited for your locality and best for profit. If undecided, consult some successful orchardist or write us and we will gladly give you the benefit of our experience.

THE BEST COMMERCIAL VARIETIES

CHERRIES

All Varieties on Mazzard and Mahaleb Root.

	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.40	$3.00	$22.50	$175.00
3 to 4 feet	.35	2.50	17.50	125.00
2 to 3 feet	.25	1.75	10.00	85.00

Early Purple Guigne, the earliest marketable cherry, April 20 to May 1.
Knight's Early Black, earliest good cherry, April 25 to May 10.
Early Chapman, large black, good shipper, early, May 1 to 10.
Black Tartarian, standard black cherry, profitable shipper, May 7 to 25.
Bing, fine large black cherry, May 18 to June 5.
Royal Anne, the standard canning cherry and an excellent shipper, May 18 to June 10.
Black Oregon, favorite for distant shipping and good money-maker, May 26 to June 15.
Lambert, large black cherry, excellent shipper, June 5 to 20.

QUINCES

All Varieties	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.40	$3.00	$25.00	$175.00
3 to 4 feet	.35	2.50	20.00	125.00
2 to 3 feet	.25	1.75	10.00	85.00

Orange, standard variety, vigorous and productive, September 5 to October 15.
Reo's Mammoth, a fine large quince, September 15 to November.
Champion, excellent quality, good size, October 1 to November.
Pineapple, bears young and regularly, productive September 1 to October 1.

PERSIMMONS

All Varieties	Each	Per 10	Per 100	Per 1000
3 to 4 feet	$0.45	$3.00	$17.50	$150.00

Hachiya, large and handsome fruit, prolific, October and November.
Tsurunoko, rapid grower, good bearer, one of the best, October and November.
Hyakume, early, large, prolific, October and November.
Dai Dai Maru, one of the best for eating, prolific, October and November.
Tone Nashi, very fine fruit, productive, standard variety, October and November.
Gosho, very productive, one of the best for quality and market, October and November.
Mammoth Gosho, new production, extra large fruit, October and November.

GRAPES

All Varieties	Each	Per 10	Per 100	Per 1000
No. 1 rooted vines	$0.10	$0.75	$3.50	$20.00
No. 2 rooted vines	.10	.50	2.50	15.00

Fontainbleau, valuable as the earliest shipping grape, July 1 to August 15.
Thompson Seedless, good shipper and dryer, August 5 to 20.
Black Prince, best early black grape, August 12 to September 5.
Rose Peru, good bearer and profitable black grape, August 12 to September 5.
Blue Malvoise, an excellent grape for certain localities, August 18 to September 1.
Malaga, the best white grape for Eastern shipment.
Purple Damascus, attractive grape and a good shipper, August 25 to September 10.
Tokay, a table grape of profitable standard, August 18 to November 1.
Black Morocco, fine large black grape, good bearer, September 3 to October 15.
Cornichon, large oval fruit, good shipping quality, September 6 to November 1.
Black Ferrera, delicious table grape of valuable market variety, September 5 to October 15.
Emperor, desirable market variety, October 15 to November 15.

ORANGES

	Each	Per 10	Per 100
1-year-old buds, ½ to ⅝	$1.50	$13.50	$125.00
1-year-old buds, ⅜ to ½	1.40	12.50	110.00

Washington Navels, the most popular orange grown, very hardy and prolific bearer.
Thompson Improved Navel, a good keeper and valuable as a good shipper.
Valencia Late, a fine orange, late keeper, being in prime condition when other varieties are out of market.

LEMONS

	Each	Per 10	Per 100
1-year-old buds, ½ to ⅝	$1.50	$13.50	$125.00
1-year-old buds, ⅜ to ½	1.40	12.50	110.00

Eureka, a good keeper and very popular.
Villa Franca, considered to be the best of all lemons, will stand a lower temperature than any other variety.

POMELO

Marsh's Seedless, rich meat, good keeper, popular variety.

NUT FRUIT

ALMONDS

All Varieties	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.40	$3.00	$25.00	$200.00
3 to 4 feet	.35	2.50	20.00	150.00
2 to 3 feet	.25	1.75	10.00	85.00

Drake's Seedling, medium hard shell, abundant and regular.
I X L, soft shells, perfect, highly recommended.
Ne Plus Ultra, soft shells, heavy, and regular bearer.
Nonpareil, paper shell, one of the best.
Peerless, fine, popular variety, large nut.
Texas Prolific, wonderfully productive.

WALNUTS

	Each	Per 10	Per 100	Per 1000
6 to 8 feet	$1.00	$5.00	.....	.....
4 to 6 feet	.65	4.00	$35.00	$250.00
2 to 4 feet	.50	3.50	30.00	200.00

Ford's Improved Soft Shell, thin shell, sweet kernel.
Franquette, a late bloomer, nuts command the highest market value.
Mayette, fine dessert nut and a sure bearer.
Santa Barbara Soft Shell, a favorite variety in Southern California.

PECANS

All Varieties	Each	Per 10
6 to 8 feet	$1.00	$7.00
4 to 6 feet	.75	5.00
3 to 4 feet	.60	4.00

Paper Shell, nuts of superior quality.
Stewart, a standard commercial variety, very profitable.

FIGS

All Varieties	Each	Per 10	Per 100	Per 1000
4 to 6 feet	$0.50	$3.00	$20.00	$175.00
3 to 4 feet	.40	2.50	18.00	150.00
2 to 3 feet	.30	2.00	15.00	125.00

White Adriatic, the standard white fig.
Calimyrna, the best of Smyrna varieties.
Capri, to fertilize the Smyrna varieties.
Mission, the best black fig.
San Pedro, fine large black fig, good flavor.

OLIVES

All Varieties	Each	Per 10	Per 100
4 to 6 feet	$0.75	$6.00	$50.00
3 to 4 feet	.60	4.50	40.00

Manzanillo, very large, fine for pickles and oil.
Mission, a fine large olive, most largely grown in California.

BERRIES

RASPBERRIES

	Each	Per 10	Per 100	Per 1000
Rooted plants	$0.10	$0.75	$2.50	$15.00

Hansel, early, good shipper, May 22 to June 15.
King, good size, an excellent shipper, June 2 to 28.
Cuthbert, large, a good shipper, June 10 to July 1.

STRAWBERRIES

	Each	Per 10	Per 100	Per 1000
Rooted plants	$0.10	$0.50	$2.50	$15.00

Dollar, the best market berry; first crop, April 28 to June 5; second crop, June 11 to October 1.

BLACKBERRIES

	Each	Per 10	Per 100	Per 1000
Rooted vines	$0.10	$0.75	$2.50	$15.00

Lucretia Dewberry, earliest and best blackberry, fine flavor, very prolific, June 1 to July 5.
Lawton Blackberry, large, black, excellent quality, best late blackberry, June 25 to August 15.

LOGAN AND PHENOMENAL BERRIES

	Each	Per 10	Per 100	Per 1000
Rooted tips	$0.10	$0.75	$5.00	$35.00

Both fine large berries, combining the flavor of both raspberry and blackberry, splendid for dessert, jelly or jam.

GOOSEBERRIES

	Each	Per 10	Per 100
Strong 1-year plants	$0.15	$1.00	$6.00

Oregon Champion, very large fruit, brownish, profitable for canning.

CURRANTS

	Each	Per 10	Per 100
1-year-old plants	$0.15	$1.00	$6.00

Cherry, large, deep red, fine for preserving, valuable market variety.
Fay's Prolific, very large, prolific, profitable.
White Grape, large, yellowish white.

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Flame Tokay, Black Cornichon, Black Hamburg, Black Gros Colman, Black Muscat, Muscat, Rose of Peru, Black Ferrara and other fresh, healthy cuttings for delivery this winter.

Prices (reasonable) on application
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YELLOW NEWTOWN PIPPINS, SPITZENBERGS, JONATHANS, WAGENERS, ROME BEAUTIES
and all of the leading varieties of apples
We also carry a heavy line of
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A general stock of peaches, such as
EARLY CRAWFORDS, ELBERTAS, LATE CRAWFORDS, FOSTERS, MUIR, TUSCAN CLINGS, PHILLIPS, MUIR, EARLY COLUMBIA, *Etc.*
Small fruits in great abundance
STRAWBERRIES, BLACKBERRIES, RASPBERRIES, DEWBERRIES, GOOSEBERRIES, CURRANTS, GRAPES

C. F. LANSING, Salem, Oregon

True-to-Name Nursery
OFFERS TO PLANTERS

Desiring strictly first-class one-year-old trees grown on No. 1 whole roots, a few thousand apple, pear and cherry of the leading varieties adapted to the Pacific Northwest. We make a specialty of growing Yellow Newtown and Spitzenberg and personally select all buds and scions from bearing and tested trees. Order now for fall 1909; get trees guaranteed "true to name," and avoid future disappointment. Address

H. S. GALLIGAN
Hood River, Oregon
Phone Home 2002K *Catalogue on Application*

A SHORT TREATISE ON PLANTING AN ORCHARD

BY B. R. TUCKER, HOOD RIVER, OREGON

THE subject assigned to me is an old one and has been many times discussed, but can never be settled, as each one must have his own fad on this subject. So I will assume that I was planting an orchard, so as not to tramp on anyone's corns, and if I should say anything that is of use to you, use it, and if not, consider the source.

First, consider drainage, soil, shelter from wind, etc. Then assume we had one-year-old trees to plant. We would cut back to twenty-eight or thirty inches and let all buds grow, except root sprouts, the first season. We would then select four buds to start our framework for our future tree, the form of which we would have already formed in our mind. The four branches we would endeavor to start as near as possible, first one about twelve inches from the ground, the other three at as near as possible opposite sides of the tree and as near equal distance as possible, as branches close together, in growing, the bark comes together and will not adhere, rendering them easily broken. After one year's growth I would select branches for frame, cut all others off and start training to my ideal shape, cutting back when dormant in spring, to promote growth until plenty of wood is grown for bearing purposes, not letting them bear but very light until old enough to bear without sapping the vitality of the tree for too small profits. Four or five-year-old trees lose more vitality producing four or five boxes of apples than in producing twelve or fifteen boxes at twelve years old. If any main branches for frame throw out large branches, I cut them off, leaving the smaller one for bearing purposes, retaining main branch to top, giving four spaces between the main branches to insert the ladder to pick apples on inner branches, and make a support for ladder for picking the top fruit. After having growth enough to bear the amount of fruit the tree is capable of bearing, according to space and character of soil, I would then do my cutting back in summer to retard wood growth and promote the growth of fruit instead. I would keep trees cut back comparatively low to avoid extra pressure from wind and make picking easier, less expensive and

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(Successors to R. H. Weber)

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CHOICE NURSERY STOCK
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Cox Orange Pippin

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To Oregon and Washington

PLANTERS

WE have a beautiful block of one-year Spitzenbergs and a fine line of one and two-year pears, which we desire to call your attention to. Please submit your list and we will make prices that will interest you.

Davis Co. Nurseries

Roy, Utah

less wood to support; as different localities and different varieties require different pruning, it is impossible to give any general rule. If the tree grows too much toward the center, cut branch close to bud facing out, and if spreading too much, cut close to bud facing inward. In general, first and last train the young tree as the child in the way you wish it to grow, and never cut a limb unless you know just what you cut for. Maintain equilibrium, admit light and air, cut back limbs that straggle and make extra growth to the length required to bear the amount of fruit the tree is capable of bearing without injury, and save extra hand pruning and grow better fruit in general. Use common judgment, avoiding extremes in pruning or non-pruning, as either costs too much money to experiment with. The nearer you get it right the better for your pocketbook. If you grow fruit of Hood River apple class, after your trees pass ten years of age, if properly handled, they should produce from $800 to $1,200 per acre, if they are of the best commercial varieties. I hope to see better pruning, better spraying, better packing and better fruit, until perfect fruit will give us our fancy pack the civilized world over.

PORTLAND WHOLESALE NURSERY COMPANY

Rooms 1 and 2 Lambert-Sargeant Building

Corner East Alder Street and Grand Avenue

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Richland, Washington

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Complete stock of leading varieties of Apples, Pears, etc.

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An Improved Freestone Peach

The best for canning, drying and market. *Fay Elberta Peach.* Superior to Muir or Lovell for canning or drying, and superior to any for market. A heavy and regular bearer, very attractive, firm, and of exceptionally fine flavor. Write for descriptive circular.

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163 Orchard Street Newcastle, California

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Outfit free

Salem Nursery Company, Salem, Oregon

AGENTS

Big money made selling our nursery stock; great demand; fine line. Cash commission weekly.

CAPITAL CITY NURSERY CO.

Salem, Oregon

CALIPER
COLOR
ROOTS

These are the external evidences of the quality of a nursery tree.

From long experience in the nursery business we have learned how to produce trees with **large caliper—stockiness,** rather than tallness.

Good color in trees is evidence of **good health,** same as in persons.

At the **bottom** of the whole **question** of good trees is the **root.** To grow trees with a **good root system—fibrous roots,** is a **science** that cannot be learned in a day or a year.

Our superintendent belongs to a family who have grown **reliable** and **dependable trees** for more than **sixty years.**

For caliper, color, and roots, our trees cannot be excelled by any nursery anywhere.

We still have a surplus of all leading commercial varieties.

Northwest Nursery Company

Incorporated

18 Yakima Avenue

NORTH YAKIMA, WASH.

W. C. HOPSON

Milton, Oregon

SPECIAL OFFER

2000 Bartletts

Budded 1908, 5 to 7 feet high

A fine general stock

Apple, Cherry, Peach and Pear Trees

And general assortment nursery stock. Extra care taken to select scions and buds from best bearing stock.

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BOTH AMERICAN AND FRENCH GROWN

The American are very promising at the present time.

The French are being grown in France on contract expressly for us, and the grading, packing and shipping is looked after by our representative there.

APPLE SEEDLINGS—All grades, straight or branched.

IMMENSE STOCK OF GRAPES—Long on Concords, 1 year, No. 1; also other leading varieties.

CURRANTS AND GOOSEBERRIES—Fine, well-rooted plants.

FOREST TREE SEEDLINGS—COMPLETE ASSORTMENT.

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WHAT ARE YOU GOING TO PLANT?

Tokays, Cornichon, Muscat or Malagas

We have them, strong well grown one year vines, finest in the land

How do BARTLETTS strike you this season? Plenty of them, stock cannot be beaten, and prices right. Then how's SPITZENBERG, YELLOW NEWTOWN PIPPIN and YELLOW BELLEFLEUR?

One nurseryman visiting our Nursery said, "Gentlemen, you should be proud of this stock," and we are. So will you be when you plant it.

What about CHERRIES? BING, LAMBERT, BLACK TARTARIAN, ROYAL ANNE and CHAPMAN. It would not be hard to sell you these, could you see them.

PEACHES, stocky, well grown, and, say, they have the roots, plenty of them, and not cut off at top of ground.

Another thing: Our prices are RIGHT, we dig our stock RIGHT, handle it RIGHT, treat you RIGHT, and it is sure RIGHT in every way. Write us and we will tell you all about it. Better still, come and see us and we will show you.

CHICO NURSERY CO. Chico, California

CALIPER—COLOR—ROOTS

THESE THE THE EXTERNAL EVIDENCES OF THE QUALITY OF A NURSERY TREE

From long experience in the nursery business we have learned how to produce trees with large caliper—stockiness, rather than tallness.

Good color in trees is evidence of good health—same as in persons.

At the bottom of the whole question of good trees is the root. To grow trees with a good root system—fibrous roots, is a science that cannot be learned in a day or a year.

Our superintendent belongs to a family who have grown reliable and dependable trees for more than sixty years.

For caliper, color, and roots, our trees cannot be excelled by any nursery anywhere.

We still have a surplus of all leading commercial varieties.

NORTHWEST NURSERY COMPANY

18 Yakima Avenue NORTH YAKIMA, WASHINGTON

PAP'S WEATHER ALARM

Saturday Evening Post.

Old Pap Peters, a resident of a small Southern town, has discovered an absolutely new use for telephone wires.

"Be you a lawyer?" inquired Pap, who went limping into a lawyer's office.

"Yes, sir; I am a lawyer. Sit down."

"I want you to fetch a lawsuit against the telephone company. Can you fetch lawsuits against them?"

"Yes, sir; we can sue them, all right. What's the matter?"

"Well, you see, Squire, I lives out yonder in the Deerhollow neighborhood, and runs a truck patch. Them telephone folks come along and sot up a big post at the corner of my fence, right nigh the gate."

The lawyer's face brightened. "Oh, yes! I see. It interferes with ingress and egress to your property; additional servitude, and——"

The old man looked bewildered.

"No, Squire; lemme finish a-tellin' you. That post is been thar nigh on to twenty year, and it's stuck fuller of wires than the hair on a hog's back; and when the weather's a-goin' to turn cold all them wires begins to sing. I kin lie right thar in my bed and hear 'em. So I gits up and goes and kivers my cabbages. Them telephone men come along an' moved that post and tuk them wires more'n a quarter of a mile away. Now I can't hear 'em sing no mo'. Last night thar come a frost, an' all my cabbages got friz, and now I wants to sue the corp'ration."

◈ ◈ ◈

R. M. KELLOGG & CO., breeders of thoroughbred pedigree strawberry plants, Three Rivers, Michigan, one of the largest and best plant houses in the world, advise us that their 1910 information booklet, "Great Crops of Strawberries and How to Grow Them," is in press and will be sent to any one upon request. This is the most instructive booklet on strawberry culture published.

◈ ◈ ◈

Almost the whole world knows of Hood River as a place that produces the best fruits, and all of Hood River Valley should know, and could know, that there is one place in Hood River, under the firm name of R. B. Bragg & Co., where the people can depend on getting most reliable dry goods, clothing, shoes and groceries at the most reasonable prices that are possible; try it.

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Of all sorts, true to name

Magnificent Assortment for Season 1909-1910

Walnuts—We offer all the leading French and American sorts, in grafted and seedling trees.

Grape Vines—All leading types of Table, Raisin and Wine Grapes, on their own roots and grafted on phylloxera-resistant roots.

"California Horticulture"

Contains descriptions of 2,000 varieties of trees and plants; also gives valuable suggestions about planting, pruning and care of orchards. Profusely illustrated. Mailed for 25 cents.

Write us today for quotations on your requirements

BURBANK CREATIONS IN PLUMS AND WALNUTS

We are sole propagators and disseminators of the Santa Rosa, Gaviota, Formosa, Vesuvius Foliage Plums and Rutland Plumcot; Royal and Paradox Rapid Growing Timber Walnuts. Send 25 cts. for beautifully illustrated booklet.

Established 1884 *Paid-up Capital $200,000*

Fancher Creek Nurseries

Incorporated

George C. Roeding, President and Manager

FRESNO, CALIFORNA

LABEL SELLS APPLES

Yakima Herald.

D. Crossley & Sons, of New York and Boston, also of Liverpool, England, and Glasgow, Scotland, have purchased the winter apple supply of the Yakima Horticultural Union. The price paid is not made public. By the deal Messrs. Crossley control some 40,000 boxes, or thereabouts, of the finest apples this district produces. Their purchase brings to North Yakima for the first time, and to the Northwest for the first time, a foreign buyer after a considerable quantity of fruit. It means that the Yakima growers, through the union, have established a foreign connection.

"Such of the fruit," said William Crossley, who was in North Yakima Thursday, "as belongs in Great Britain or in Europe will be sent there, and such as belongs in New York and the Eastern American markets of this country will be sent there. By that I mean that we will place the fruit according to the market for which it is best adapted. I want to say right now, also that the Spitzenbergs are the very best I have ever seen.

"It is because of the fact that we have had, heretofore, the fruit packed and shipped by your horticultural union that we are back again this year. You know that we also had the prize fruit from the National Apple Show last year. We buy here because your horticultural union is a guarantee of excellence and uniformity of pack. We know that the output of your union is excellent, and after our customers have purchased the fruit they will know it. We are working, not for this year, nor for next year, but for years to come. Grading, packing, selection and all those things mean so much that I think I should say for your union that, having had some of its fruit last year, we are back again this year for more of it."

Mr. Crossley expressed himself as greatly pleased with the quality of the fruit grown here, and also, by his action, with the manner in which it is handled. Work on filling the order began Thursday, when two cars were loaded out from the horticultural union.

◈ ◈ ◈

THE Goulds Manufacturing Company, Seneca Falls, New York, has issued a very attractive booklet, "How to Spray, When to Spray and What Sprays to Use." This will be sent on request to any fruit grower. It is interesting and well worth reading.

FOR SALE

2,000 yearling Spitzenbergs
1,000 yearling Newtowns
1,000 yearling Baldwins
25,000 yearling fruit trees for fall 1910

T. L. LAWSON Gates, Oregon

The Best are the Cheapest!

ROSES! ROSES! ROSES!

Try getting your Rose Bushes from **The Sibson Rose Nurseries** of Portland, Oregon.

Popular varieties at popular prices. Also the most beautiful new introductions. They are the leading and largest growers and importers of fine Roses in the Northwest.

Once a customer, you will not want any other Roses.

Shipped only by express, plants being too large for mailing.

Catalogue free.

Number 1180 Milwaukie Avenue, Portland, Oregon.

Lafayette Nursery Co.

Growers of Standard Sorts and Commercial Varieties

APPLE, PEAR, PEACH, CHERRY, Etc.

Remember, the Root System is one of the most important factors. Ours are unsurpassed.

Regardless of your wants, you cannot afford to place your order until you hear from us. Write today.

Address: LAFAYETTE, OREGON

Mention "Better Fruit"

Ten Carloads *of* Apples Wanted

We will require this season ten carloads of extra fancy apples of the following varieties:

DELICIOUS (true Stark Delicious) KING DAVID (true Stark King David) STAYMAN WINESAP BLACK BEN, etc.

Please quote on the quantity and grade you can supply, f. o. b. cars at your point.

Stark Bro's Nurseries & Orchards Company

Louisiana, Missouri U. S. A.

The Wapato Nurseries

TIM KELLY, *Proprietor*

Sales Office: North Yakima. Nursery and Business Office: Wapato, Wash.

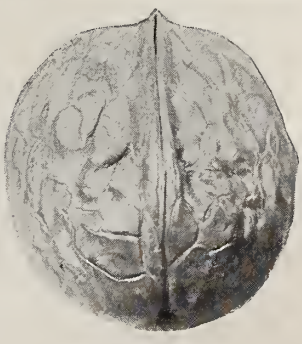
1,500,000 Fruit Trees ***1,500,000 Fruit Trees***

WE BELONG TO NO TRUST

We guarantee our trees absolutely true to name. Our stock has been "the standard of excellence" wherever placed. Our system of budding and grafting, and the admirable location of our nurseries, together with our long experience in California and other Western states in planning and planting orchards, makes our advice invaluable to beginners and to those who contemplate commercial orchards. See us

Get our Prices. Remember the Best is Always the Cheapest

San Jose Mayette



The only really immune commercial walnut; blooms late, but matures earlier than Franquette; is a heavy bearer, and nut a true Grenoble type. Franquette in the same orchard in San Jose, California, blights badly

LEONARD COATES NURSERY CO., Inc.

Sole Distributers Morganhill, California

From nursery direct to the planter, the world's standard trees (Stark Trees) are now sold at

25% DISCOUNT TO MAIL ORDER BUYERS

FOR ALL CASH-WITH-ORDER BUSINESS. In addition to giving this liberal discount, we also prepay freight to any point in the United States, on orders amounting to $10 or more, box and pack shipments without extra charge (most nurserymen make extra charges for boxing and packing), guarantee safe arrival, give generous premiums and assure every customer complete satisfaction.

Why We Make This Offer

Heretofore Stark Trees have been sold through salesmen, to whom we have paid a commission for sending us your orders. We have now discontinued selling through salesmen and are dealing direct with the planter in the irrigated valleys and orchard regions of the West. Thus the commissions formerly paid are saved—and given to you.

Our Catalogue-Price-List Is Our Only Salesman

In this state, and it is a top-notch salesman, too—better by far than most men salesmen. Every question you could ask, it will answer, and the answer will be correct—not a guess. Every variety in all classes is fully described, strong and weak points are pointed out—(everything is not listed as "best," as is the case with most nurserymen's literature). Following each variety is a key indicating the section of the country where experience has proven that variety will succeed.

This book contains accurate and valuable information on methods of planting, fertilization, cover crops, planting and care of trees, suggestions for spraying, pruning, etc., etc. Over 150 illustrations from actual photographs are within its pages.

You could not ask for a better salesman than is our catalogue-price list. With it in your hands you can order more successfully, conveniently, and with better results than you could by talking to the best informed nursery salesman. Send for it today.

Have You Planted Stark Delicious?

If not make it the first and biggest item on your next order—you'll never regret it. Delicious is the most wonderful apple known to horticulture for quality, keeping qualities and selling value. This year at the sale of the Wenatchee Valley (Washington) Fruit Growers' Association, Delicious brought $3 per box f. o. b. there (the present market value is $4), while Spitzenberg brought only $2.50, Winesap $2.25, Jonathan $1.90, Black Ben $1.75 (now $2, selling with Jonathan), Baldwin $1.15, Ben Davis $1.40, Gano $1.50, etc.

Luther Burbank, wizard of horticulture, says: "Delicious is a gem, the finest apple in all the world. It is the best in quality of any apple I have so far tested"—and Luther Burbank knows.

Delicious Brings $2,000 Per Acre.—One hundred seven-year-old Stark Delicious apple trees in the Bailey orchard, Chelan County, Washington, earned $2,000 for their owner last year and when prices were low—or an average of $20 per tree for one season's crop.

Delicious is today making more profits—big profits, for the long-headed, far-sighted orchardists who have planted it than any other variety. Write for "The Apple Stark Delicious," a booklet giving its full history and the opinions of the world's greatest horticulturists and successful orchardists. It will convince you. Last year we sold 1,250,000 trees of Delicious alone and could have sold another quarter million had we had them. Planters nowadays do not buy a variety at that rate unless there's a reason. And there is one—send for the booklet.

Stark King David Apple

You should plant it along with Delicious—plant it largely—you'll never regret it. It's a money-maker and a big one. It has highest quality, is a long keeper, very hardy, and has beautiful color. Sells at highest prices. Many planters think it better than Delicious.

In my opinion King David will surpass Delicious as a commercial apple. It is fine as silk. —Rev. T. H. Atkinson, Entiat, Washington.

Was in Mr. Olds' orchard last week. His King David three-year-old trees will bear quite a lot of fruit this year. I consider them far ahead of Jonathan—the fruit is larger, has better color and flavor, and is a better keeper.—D. J. Hayden, Chelan County, Washington.

King David stood 25 degrees below zero last winter without injury, while Ben Davis suffered severely.—R. G. McDougall, Chelan County, Washington.

King David, a very rich red, makes a most beautiful apple. Hangs on the tree well, equal to Ben Davis and just as productive; quality is equal to Spitzenberg: picked three boxes from one scion grafted on Ben Davis. It is the finest apple you have for this part of the country; the most beautiful apple grown; can't help but sell anywhere, and ahead of all others. Have heard nothing but King David all this season. Have had to date fifty-two parties at my place to see these apples.—F. Dando, Chelan County, Washington.

Include King David in your next order. You'll never regret it and will want more when you see its magnificent fruit.

Stark Early Elberta Peach

One of the good things you cannot afford to overlook. It is winning golden opinions from experienced fruit men the country over. Better quality than Elberta and ripens ten days to two weks earlier, reaching the markets when all other good peaches are scarce, and thus commanding high prices. A great shipping peach, surpassing Elberta.

I believe Early Elberta is one of the best varieties introduced since the first Elberta came. In Early Elberta one has all of the good qualities of Elberta, and the additional feature of early ripening. When this is taken into consideration, and when it is planted along with the original Elberta, much of the strain and congestion which comes with peach harvest will be greatly reduced. The shipping season will be lengthened.—E. H. Favor, assistant horticulturist, Davis County, Utah.

Having tested its shipping and keeping qualities thoroughly, without doubt it is the most valuable addition to the commercial peach list introduced in recent years; an excellent shipper, and as a keeper it has no rival.—L. Marsh, horticultural inspector, Davis County, Utah.

J. H. Hale (the peach king) wrote me that he took some Early Elberta home from Georgia and that they kept nearly twice as long as Elberta.—Dr. Sumner Gleason (originator of Stark Early Elberta), Davis County, Utah.

Early Elberta is all right. Two trees bore fine, yellow, spicy fruit, and although not a full crop, it was more than was produced by fifty Elberta trees in the same orchard. Ripened with Carman.—E. H. Riehl (Illinois Experiment Station) president Alton Horticultural Society, Madison County, Illinois.

Stark Early Elberta is worthy of your utmost confidence—plant it largely and reap the harvest of profits which will surely follow. The true Stark Early Elberta can be had only of us. We purchased the exclusive propagating right from the originator, Dr. Sumner Gleason.

Other Western Varieties

The success of an orchard is dependent upon the judgment displayed in the selection of varieties—the profit-paying kind. And profit in fruit growing means quality. Quality and color are the two things that the great fruit consuming public pay their money for. That's certain—you can't deny it.

Increase your orchard profits—do it by planting the splendid tested special sorts of Stark Trees. Begin now—don't wait until next season. Plant now and be that much nearer a big profit-paying crop than you would be by waiting six months or a year.

Here is a brief list of varieties highly adapted to Western conditions—the kind that will make a model orchard which will yield profitable returns:

Apple—Senator, Banana, Jonathan, Newtown, Black Ben, Spitzenberg, Rome Beauty, L. Raspberry, Stark Delicious, Stayman Winesap, Stark King David.

Peach—Muir, Alton, Elberta, Lovell, Krummel, Red Bird, Crawford, Levy Late, Phillips Cling, S. E. Elberta, June Elberta.

Grape—Mission, Worden, Niagara, Campbell, Flame Tokay, Stark Eclipse, Moore Early, White Muscat, Stark King Philip, Black Cornichon, Thomp's Seedless.

Cherry—Bing, Lambert, Royal Anne, Montmorencies, Royal Duke, Black Tartarian.

Apricot—Royal, Tilton, Blenheim, Moorpark, Colorado, Wenatchee.

Pear—Anjou, Bartlett, Lincoln, Comice, Winter Nelis, Easter Beurre.

Our stock of the above and all other varieties worthy of propagation is complete in every sense of the word—all sizes in one and two-year, but only one quality—"Stark Sterling Quality."

Fast Daily Freight Service

Because of a vast volume of business we are able to maintain a daily fast through refrigerator freight service to Western points, thus insuring the arrival of all shipments in perfect condition. *Remember, we pay the freight on $10 orders, and guarantee safe arrival.*

USE OUR SPECIAL SERVICE DEPARTMENT FREE—If you contemplate planting an orchard in either a large or small way, let us assist you. Our Special Service Department will advise you as to best varieties for commercial or home orchard, best methods and time of planting in your locality, spraying, care of trees, and other valuable information. This service is given without charge and will in no way obligate you to buy of us. The department is maintained to promote greater interest in the planting of the best and most profitable varieties of fruit known. Address

Stark Bro's Nurseries & Orchards Company

Lock Box Number 57 Louisiana, Missouri, U. S. A.

Seeds

THE KIND YOU CAN'T KEEP IN THE GROUND

They grow, and are true to name.
Write for prices on your wants

188 Front Street **J. J. BUTZER** Portland, Oregon

Poultry Supplies, Spray, Spray Materials, Fruit Trees, Etc.

Russellville Nursery Grows Trees of Quality

ACKNOWLEDGED BY MANY LEADING NURSERYMEN AND FRUIT GROWERS TO BE THE BEST GROWN ON THE COAST

For commercial orchards we quote the following: 100,000 apple, 50,000 cherry, 50,000 pear and other stock in proportion. Thirty acres of ornamental trees. See our stock and get prices before buying elsewhere. No agents.

Mention "Better Fruit" **H. A. LEWIS, Proprietor, Montavilla, Oregon**

FRUIT GROWERS, YOUR ATTENTION!

Royal Ann, Bing and Lambert cherry trees; Spitzenberg and Newtown apple trees; Bartlett, Anjou and Comice pears, and other varieties of fruit trees

A. HOLADAY MONTE VISTA NURSERY SCAPPOOSE, OREGON

OUR TREES ALWAYS PLEASE

Satisfaction guaranteed

A NICE ASSORTMENT OF COMMERCIAL VARIETIES

Prompt attention given to mail orders

SELAH VALLEY NURSERY CO. R. F. D. No. 2, Selah, Washington

COMPLIMENTS BETTER FRUIT ON ITS MERITS

A MEMBER of the firm of Long, Critchfield & Co., advertising agents, E. E. Critchfield, who owns a large fruit ranch in the Snake River Valley, compliments "Better Fruit" for the value of the paper and as an advertising medium.

Mr. E. H. Shepard, Hood River, Oregon.

My Dear Mr. Shepard: I do find so very much that is entertaining, instructive and thoroughly helpful in "Better Fruit" that I cannot honestly refrain from telling you so. Then, too, I belong to that old-fashioned class which believes it better to give deserved honor and praise now, rather than to couch the psalm of satisfaction in an epitaph.

With me, "Better Fruit" is a perfect fit. Seems just as though each particular number had been made especially for me. Contains always just the things I want to know and answers the questions I would have asked. I keep and carefully file each copy. I have had many occasions to refresh my memory by looking over past issues.

Here is a little experience which may be of interest to you. We eat lots of fruit in this house, all we want. We like it so much better than medicine, and it is so much better to buy big, red apples than to pay doctors. Because we have forty acres of apples started in the Snake River Valley of Idaho, we decided to study closely quality, pack, etc., in our last winter's apple supply. Accordingly, we agreed that every apple should be divided and examined for worms, specks, holes and all other imperfections of whatever nature. We used, during the winter, seventeen boxes of several different varieties of apples. These came from Hood River, Toppenish, Wenatchee, Rogue River, Payette, Blackfoot and Twin Falls. All were bought on South Water street, Chicago, the average price being $3.20 per box, which included always the 25 cents express from the city to our suburb. I opened every box in person and carefully inspected the pack. So far as we know, every apple in the seventeen boxes was cut in half and examined for imperfections. I consider it but honest and well deserved praise to growers, packers and shippers to say that the record shows but one apple with a worm in it, and but one decayed apple.

In most cases I wrote to the grower, whose name was found on the end of the box, and told him just how his fruit had come through and

The SUNNYSIDE NURSERY COMPANY

Retail and Wholesale Nursery

To make a success of the nursery business there are a number of vital points to consider:

POINT 1—A SUITABLE LOCATION
POINT 2—BUSINESS ABILITY OF MANAGEMENT
POINT 3—EQUIPMENT FOR HANDLING STOCK
POINT 4—GOOD STOCK AND HONEST DEALING

Point 1—We are located in the great fruit belt of Washington, where the long growing season, bright sunshine and deep, well drained soil enable us to grow the best tree, from point of size, smooth body, free from fungus, and best rooted trees in the world.

Point 2—F. K. Spalding, president of the company, has had years of experience as salesman and grower; W. S. McClain, secretary, a specialist in orchard work; Harry K. Spalding, vice president, a law graduate and competent office man and salesman; George Emmert, treasurer, expert bookkeeper, former graduate and teacher of commercial work; J. H. Mann, field foreman, one of the most skilled nurserymen in the West—foreman for years for J. C. Hale of Tennessee.

Point 3—We have a well equipped six-room office, large packing house, large packing ground, with three hundred feet of railroad frontage. Electric lights, making it possible to work a day and night force in packing season.

Point 4—We use scions from best fruit orchards, true to name; do not spare money or labor to make good our claim as leaders in honest, clean nursery stock.

AWARDED THE GOLD MEDAL FOR BEST NURSERY STOCK ALASKA-YUKON-PACIFIC EXPOSITION, SEATTLE, 1909

Write for Catalogue and Prices MAIN NURSERY AT SUNNYSIDE, WASHINGTON

how well we were pleased with the results of his painstaking labor. I have had some most delightful correspondence with these good men, and true.

Now, I have recorded these facts just that you may know that men do appreciate your labor and struggles and triumphs, and I wrote the growers because I wanted them to know this also, believing that the servant of the public is ever worthy of his hire.

In closing this letter, permit me to indulge in the hope that your work is only well begun and that you may ever be possessed of the strength and the means to carry it to that ultimate, successful completion, which I earnestly prophesy and desire for you. Sincerely yours,

E. E. Critchfield.

Wheaton, Illinois, September 27, 1909.

E. E. Critchfield is a member of the firm of Long, Critchfield & Co., Chicago, an advertising agency that makes a specialty of agricultural advertising and does an immense business. A letter from a man in Mr. Critchfield's position is certainly strong evidence in behalf of the merits of "Better Fruit" as an educational paper for the fruit grower and as an advertising medium for all firms doing business with fruit growers.

◈ ◈ ◈

THE Chas. H. Lilly Company were the recipients of seven gold medals, awarded them by the jury of awards at the recent A.-Y.-P. Exposition, two of which were awarded them on the merits of their seeds, four on account of the excellent quality of their poultry and stock foods, and one for their novel exhibit, which probably many readers of "Better Fruit" will remember for many years to come on account of its attractiveness as a model of a farm, made quite realistic with clever electrical and mechanical effects. The Chas. H. Lilly Company are to be congratulated on these awards.

ORENCO TREES

YELLOW NEWTOWN PIPPIN
SPITZENBERG
ROME BEAUTY
WINESAP
STAYMAN'S WINESAP
ARKANSAS BLACK
WINTER BANANA
WAGENER, ETC.

One-Year-Old Tops Budded on Three-Year-Old Roots

The kind of a tree all large commercial planters buy—and the kind YOU SHOULD buy. This system makes a strictly first-class tree and you'll save money in the long run by planting such trees.

Look at the Roots

They are the all-important part of a tree. It is just as essential to the success of a tree that it has a good foundation as it is to a building. Again we say, look at the roots.

PERHAPS YOU WILL NEED SOME PEACH, PEAR, CHERRY OR WALNUT TREES THIS SEASON

Remember, ALL our trees are grown under the above system, insuring strong, vigorous, healthy-growing trees. Plant none but ORENCO trees—the "three-year-old-whole-root" kind. They'll bring results.

Oregon Nursery Company

"Salesmen wanted" ORENCO, OREGON

DO YOU WANT

Trees of Quality?

You are either not interested in "Trees of Quality," or you have not investigated for yourself what The Winfield Nursery Company is doing in the horticultural world.

Our booklet, "Trees of Quality and What Others Say of Them," illustrates our system of breeding up and selecting the best. It further tells of the big commercial planters' experience with The Winfield Nursery Company's trees in irrigated districts.

Best Scions from Your Own Country

Do you know we now have men in your locality visiting the best orchards to mark them, showing improved individuality from which to select scions? Mail coupon at once.

The Winfield Nursery Co.

Incorporated

J. Moncrief, *President* Winfield, Kansas

COUPON

I am interested in "Trees of Quality" and will plant about ..... trees. Mail free of charge your booklet.

Name .....

Post Office .....

State .....

WALNUTS

GRAFTED FRANQUETTE TREES

IF YOU WANT the best of anything, go to one who specializes on that thing. We are offering the best that can be produced in the walnut line. Grafts selected only from our heaviest bearing trees of Vrooman strain and grafted on the best selected California and Royal hybrid roots grown. Also, on the same rapid-growing roots, Mayette, Parisienne, Meylan, Bijou, San Jose Mayette, etc., or any local variety of which you have grafts, if ordered a year in advance. Write for catalogue and price list.

IMPERIAL WALNUT NURSERY

R. F. D. No. 7 San Jose, California

Hood River Nurseries

Have for the coming season a very complete line of

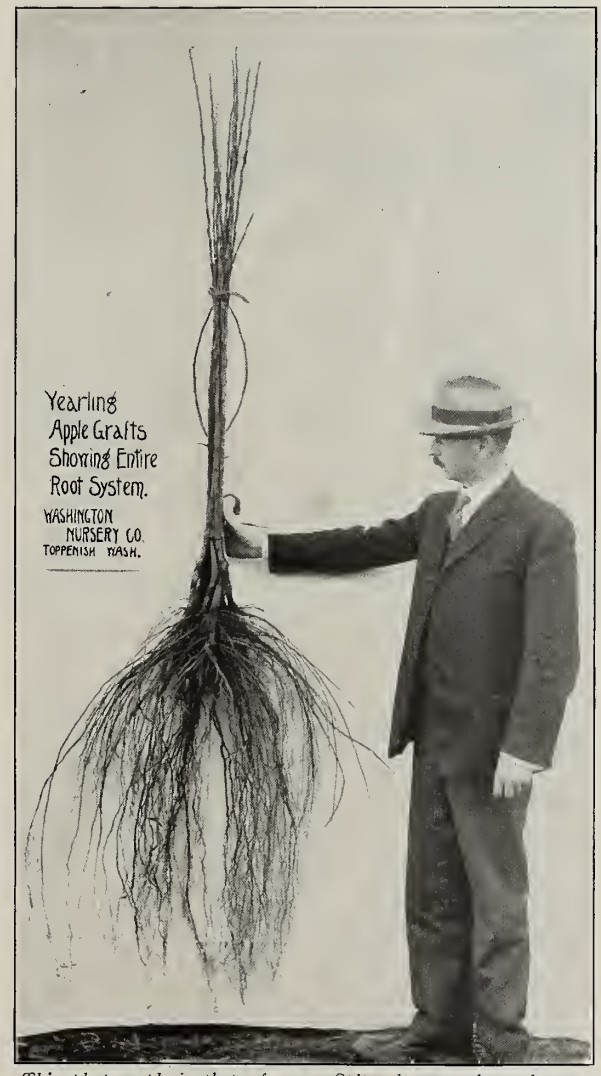
NURSERY STOCK

Newtown and Spitzenberg propagated from selected bearing trees. Make no mistake, but start your orchard right. Plant generation trees. Hood River (Clark Seedling) strawberry plants in quantities to suit. **Send for Prices**

RAWSON & STANTON, Hood River, Oregon

THE GREATEST APPLE NURSERY IN THE WEST

GREATEST IN NUMBER OF APPLE TREES GROWN
GREATEST IN QUALITY AND CONTINUED EXCELLENCE OF STOCK
GREATEST IN ABILITY TO HANDLE LARGEST COMMERCIAL ORDERS
AS WELL AS SMALLEST INDIVIDUAL ORDERS



This photograph is that of some Spitzenberg grafts, taken on October 9, 1909, showing entire root—one year's growth. This is certainly good evidence that we have the soil in which to grow good trees, and that having the soil we know how to cultivate to develop the marvelous root system for which our trees are famous

Here are Some Real Figures They Tell the Tale

1909—Total apple plant, all varieties, 1,891,000 trees

Total in ten leading varieties as follows:

Jonathan	237,000
Rome Beauty	134,000
Wagener	129,000
Spitzenberg	170,000
Newtown Pippin	204,000
McIntosh Red	369,000
Winesap	246,000
Arkansas Black	34,000
Winter Banana	46,000
Transcendent	73,000

Enough of these ten varieties to plant the entire Tieton project of about 32,000 acres, on which the government is spending about two and a half million dollars for water alone.

Here are some single orders we are filling this season:

One order 400,000 trees
One order 110,000 trees
One order 70,000 trees
One order 50,000 trees
One order 40,000 trees
One order 35,000 trees
One order 21,000 trees
Two orders 15,000 trees
One order 12,000 trees
Two orders 10,000 trees
One order 7,500 trees
One order 5,000 trees

Besides any number of orders ranging from 500 to 2,500 trees, and thousands of smaller ones

WE GROW LARGE BLOCKS OF ALL THE STAPLE COMMERCIAL VARIETIES OF FRUIT PROPAGATED FROM SCIONS OF BEARING ORCHARDS

Our stock is grown by skilled nurserymen, under ideal climatic conditions, and is thoroughly matured and ripened before digging. We know how to plant, cultivate, mature, dig and deliver your trees in a thoroughly systematic manner.

IF INTERESTED ASK FOR CATALOG

WASHINGTON NURSERY COMPANY

Agents Everywhere

Toppenish, Washington

PORTLAND ROSES ARE HONORED AT SEATTLE

NEARLY every visitor to the Alaska-Yukon-Pacific Exposition at Seattle noticed three large beds of beautiful roses planted on the lawn of the Oregon State building. Each bed contained about 100 plants, respectively, of Frau Karl Druschki (white), Richmond (blood red) and Miss Kate Moulton (salmon flesh pink).

It was quite late last spring before the ground was ready for planting, but the roses were well cared for and succeeded beyond expectation. The plants made splendid growth, and were continuously in bloom from the opening to the close of the exposition. The contrast of color was admirable, and the beds were a source of pride to many Oregonians who visited the Oregon State building.

In recognition of their superior excellence and fine blooming qualities, the A.-Y.-P. Exposition has awarded the grand prize for roses to the Sibson Rose Nurseries, of Portland, by whom the plants were furnished. By special request of the board of regents of the University of Washington, the beds and roses are to be left intact in the grounds of the Oregon building, as a permanent decoration.

Mr. Sibson is in receipt of the following cordial letter:

University of Washington, Seattle, October 28.
William S. Sibson, Portland, Oregon.

Dear Sir: I am directed by the board of regents of the University of Washington to acknowledge the receipt of and to thank you for your generous donation to the university of the beautiful roses set out and grown by you on the A.-Y.-P. Exposition grounds around the Oregon State building, and to assure you of our heartfelt appreciation of this splendid gift.

With best wishes for your welfare and success, I remain, dear sir, very respectfully yours,

Wm. Markham,
Secretary Board of Regents.

Send for SPRAY BOOK FREE for the asking

KILL THE SCALE THAT KILLS THE FRUIT

There is no solution so effective as Lime and Sulphur for the destruction of Scale, Oyster Shell Bark Louse, Leaf Curl, Peach Moth and Peach Mildew; and none of the many brands now on the market so strong, pure and free from sediment as

LILLY'S BEST LIME AND SULPHUR SOLUTION

Read what Professor R. W. Thatcher of the Washington Agricultural College says:

"THE CHAS. H. LILLY CO.:—I have examined the sample of your Lime-Sulphur Solution, which you sent in recently, and find that it shows a specific gravity of 1.3269 and contains 25.86 per cent sulphur in solution of .3432 grams per cent. This is the most concentrated solution we have ever examined.

Allow me to congratulate you on your success in working up your factory to the point where you can produce so concentrated a solution as this."

Yours very truly,
R. W. THATCHER,

SOLD BY DEALERS

Made by THE CHAS. H. LILLY CO.
SEATTLE—The Big Seed House—PORTLAND

Hemingway's

ARSENATE OF LEAD

A Perfect Product
Properly Packed
Honestly Priced

Guaranteed to meet the requirements of the various State Agricultural Authorities

For Coast Prices and Supplies
Address the Agents

KERR, GIFFORD & CO.
Portland, Oregon

Stranahan & Clark

DEALERS IN

Commercial Fertilizers
Land Plaster, Lime
Plaster Paris, Cement
Building Plasters

HOOD RIVER, OREGON

HOW TO FIGHT SAN JOSE SCALE

San Jose Scale is a factor that every orchardist and fruit grower has got to reckon with. It is now wide-spread throughout the country and is one of the most destructive of fruit tree pests. Once the Scale has fastened on your trees, if let alone, it will never stop until it has sucked the last drop of sap from the limbs. As a progressive grower you must fight the Scale until you have exterminated it entirely. There are many sprays on the market for fighting this pest, but

SHERWIN-WILLIAMS
LIME-SULFUR SOLUTION

is the best one for the purpose, for *it is sure death to the Scale.* It contains the highest amount of sulfur in sulfide form and will burn through the waxy-like covering of the Scale and kill the insect working underneath. It is vastly superior to the oil sprays on the market today, as it does not tend to close up the pores of the tree and thereby endanger its life.

Spray now while your trees are dormant. For further particulars and prices write our nearest office.

THE SHERWIN-WILLIAMS CO.

MANUFACTURERS OF
HIGHEST GRADE INSECTICIDES AND FUNGICIDES
FACTORIES: CLEVELAND, CHICAGO, NEWARK, MONTREAL, LONDON, ENG.
SALES OFFICES AND WAREHOUSES IN PRINCIPAL CITIES 708

Medford Spray Co.
MEDFORD

Oregon Spray Co.
PORTLAND

Hood River Spray Mfg. Co.
HOOD RIVER

These Factories Make and Distribute the Famous

NIAGARA
Lime-Sulphur Spray

The leading fruit growers and fruit growers' associations of the Northwest use NIAGARA exclusively

There is a Reason Why

NIAGARA is made under special process originated by ourselves. The only known process by which is made a permanent, clear and reliable solution of lime and sulphur of sufficient strength to meet all requirements

Write for Further Information

Wherever Fruit Excels NIAGARA SPRAY ***is Used***

LETTERS AND COMMUNICATIONS OF INTEREST

R. M. KELLOGG COMPANY
Breeders of
Thoroughbred Pedigree Strawberry Plants
Three Rivers, Michigan, October 18, 1909.

E. H. Shepard, Hood River, Oregon.

Dear Mr. Shepard: Mr. Robert Russell, of Port Hammond, British Columbia, in sending for our catalogue has enclosed your very courteous note of the 9th inst., in which you refer so kindly to our catalogue. This note is simply to say that we appreciate more than we can tell you such a courtesy, and such cordial expressions of confidence serve only to make us more determined than ever to be worthy of it.

While writing, let us say that we have scheduled "Better Fruit" for our 1910 advertising. Not only do we appreciate the courtesies you have shown us, but we very highly appreciate the direct returns which we have received from advertising in the pages of "Better Fruit." You have an advertising medium of the very highest quality, and the results which we have received fully sustain your highest claims concerning that aspect of your typographically handsome and splendidly edited publication.

With best wishes for your continued success and ever-increasing prosperity, we remain,

Very truly yours,
R. M. Kellogg Company.

◈ ◈ ◈

Bremen, den 24 Septembre, 1909.

Frank W. Power, Esq., Secretary State Horticultural Society and Manager East Goodnoe Nutland Company, Portland.

Dear Sir: I make as agent at this place a very large business in dried fruits from Italy, Spain, Greece and Asia, and looking into the "Official Organ of the Northwest Fruit Growers' Association," "Better Fruit," I have seen that your country produces a lot of almonds and walnuts.

I therefore should like to know whether it is possible to do also some business with your good self in these articles. I therefore ask you to be so kind to give me your particulars about the various kinds of fruits, prices cif. Bremen, selling conditions, when ready for shipment, and my commission.

A large business is done at this place in these articles from Italy, Spain and France, and the present prices are about the following:

France walnuts, from M.20. to M.32., according to size.

Italian almonds (Bari-Puglie), from M.100. to M.130., according to size. Prices per 50 kg., cif. Bremen, ninety days' draft acceptance against documents.

Now you will be able to calculate whether a sale to Bremen will leave you some profit, and if so, please quote and send me registered samples

Here's Something New From Kalamazoo

You can save enough real money in getting a Kalamazoo, to buy most of your fuel—pay your taxes, buy a dress or suit of clothes or materially increase your bank balance. You get the best made—the most economical—the most satisfactory stove or range to be had anywhere at any price. With an actual cash saving of from $5 to $40 on your purchase. Hundreds of thousands of satisfied users have told us this is true.

We make it easy for any responsible person to own a Kalamazoo. We are the *manufacturers*. You get lowest factory prices, 360-days' approval test, and our convenient terms. Take your choice—

Cash or Credit

Write for Catalog No. 574 and special terms. It gives you all the necessary information about buying and using a good stove or range. Compare our prices and quality with others, prove for yourself what you save in buying a Kalamazoo for cash or on time. *Freight prepaid. Safe delivery guaranteed.*

Kalamazoo Stove Co., Mfrs.
Kalamazoo, Mich.

This Oven Thermometer saves fuel and makes baking easy.

"A Kalamazoo Direct to You"
TRADE MARK REGISTERED

Malthoid Roofing

The roofing that always makes good. No matter how big or little the job, Malthoid fits every condition and renders a roof service that is absolutely incomparable. If you want the roofing that is right—demand Malthoid. Made by the original makers of ready roofings.

THE PARAFFINE PAINT CO.
San Francisco Portland

Stewart Hardware & Furniture Company, Distributors, Hood River

ORCHARDIST SUPPLY HOUSE

FRANZ HARDWARE CO.
Hood River, Oregon

C. M. SHAW ROY F. DEAN

Dean & Shaw

Electrical Supplies and Fixtures
Scientific Electrical Construction

Home Phone 3 Hood River, Oregon

VEHICLES AND AGRICULTURAL IMPLEMENTS

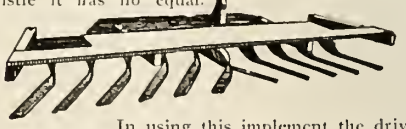
THE BEST OF ORCHARD AND GARDEN TOOLS A SPECIALTY

GILBERT - VAUGHAN IMPLEMENT CO.
HOOD RIVER, OREGON

KIMBALL CULTIVATOR

PRICE $20 F. O. B.

Is the one to use in all orchards. It is 8½ feet wide, very easy to guide, has a fender which prevents striking the tree with knife. No hoeing of trees where used. Two horses used on it in orchard, for destroying briars and Canada fern, pink, sorrel, oats, thistle it has no equal.



In using this implement the driver will stand in center of board, over knives, and to guide it will step to right or left, as occasion requires, and if anything should catch or gather on the knives the driver will step forward on draft board, tilt the handle forward, raising the knives, so that anything that has gathered on them may free itself. Keep all of the burrs tightened, and should any of the knives get bent out of shape force them back to place without removing them from the frame.

S. P. KIMBALL Salem, Oregon

by return of post, as in case of business the nuts have to be here latest on the 10th of Decembre.

As your produce is not known here yet, I cannot do anything for you without samples.

Awaiting your answer, at any rate I am, dear sir,

Yours faithfully,

A. zur Linde.

◈ ◈ ◈

Weiser, Idaho, October 25, 1909.

E. H. Shepard, Editor "Better Fruit."

Dear Sir: I am a subscriber to "Better Fruit" and take a great interest in the articles you publish therein. I think your paper is the best paper on horticulture that I have ever read, and I am much interested in the discussions found in the paper from month to month.

I have been watching with considerable attention, expecting to find some article in "Better Fruit" upon the question of water temperature on crops, but have not been able to find a discussion upon that subject, and so have concluded to write you personally upon the matter.

There is considerable discussion here over the matter of water temperature for the irrigation of crops and fruit trees and I would like your opinion upon this matter. There are systems of ditches in this country which tap the rivers and carry the waters of the rivers direct to the lands irrigated. There are also locations here that could be irrigated by means of wells, providing water when taken from the wells would not be too cold for irrigating purposes, or would not affect injuriously the trees and crops upon which it is used. No one here seems to know definitely whether cold water that would come direct from a well by a pumping system would be more likely to injure trees and crops than the water that flows through an irrigation ditch and is warmed by the sun and air before it reaches the place of use on the trees and crops. Can you give me any definite knowledge in this matter? Now that we are getting cheap electrical power, it is apparent there are many places where the water could be lifted direct from wells at a less expense than to carry it miles in an open ditch and through flumes, in which a great quantity of the water is lost and the maintenance of which is very expensive.

I would be pleased to hear from you definitely upon this subject. You no doubt have within your means definite information concerning this matter, and I would be pleased to know what you think upon the subject.

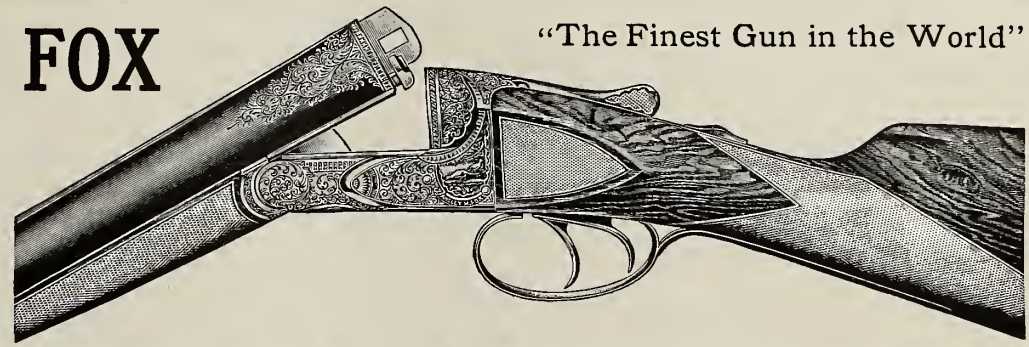
Respectfully yours,

Lot L. Feltham.

We publish this letter for the purpose of inviting discussion. We would like a short article on this subject from any one who has had experience for the next issue of "Better Fruit." We suggest articles of from 500 to 1,000 words. It is important and we hope this request will meet with response from several people. We will publish the best article we receive on the subject.—Editor.

THE A. H. FOX

"The Finest Gun in the World"



The genuine Ansley H. Fox double barrel hammerless gun is the gun that has such few parts, hence its strength, as these parts are made much stronger where other gun parts are weak.

All A. H. Fox Guns have Krupp fluid steel barrels. All A. H. Fox Guns are liberally guaranteed. Made in 12-gauge only, and in five grades. For sale by all progressive dealers and jobbers on the Pacific Coast and by

THE A. H. FOX GUN CO. 4682 North Eighteenth Street, Philadelphia, Pa.

Read Colonel Roosevelt's Comment on Fox Guns in October Scribner's

There isn't any other spreader that does the work so successfully, so completely as the

Litchfield MANURE SPREADER

In a class by itself

Can't choke—easiest to operate because there is only one lever—simplest in construction and free from all complicated parts—a boy or a careless hired man can run it as easily as a man who has had experience with spreaders all his life. Only spreader with all steel traction wheels—no cast or malleable iron hubs—no crystallizing or cracking off at hubs and tires as in other makes of wheels. Each Litchfield equipped with

Bull Dog Double Beater Wheel with long and short teeth

One of the greatest trouble and draft savers on the machine. An endless conveyor makes big loads possible. Conveyor slats are hinged and clean automatically—self-oiling bearings insure least wear from friction in vital parts. No-Choke Box, the wagon box abruptly widened to loosen manure as it reaches beater. Two and three-horse adjustable hitch. That's why the Litchfield Spreader entails the Lowest Cost, Lowest Running Expense and Least Repairs.

The only spreader that meets the winter climatic conditions in the Pacific Northwest

This is evidence from your neighbors about the successful operation of the Litchfield, right here.

OREGON

"By reason of its construction it is lower than other spreaders, consequently easier loaded—light in draft—doesn't work my team to death—the one lever makes it easy to handle. Must say it spreads the manure very evenly—substantial machine combined with simple construction and durability—a first-class machine."—L. M. Hesse, Hillsboro, Or.

WASHINGTON

"Strongly constructed—one of the girls can operate it account of its simplicity—can be stopped when half loaded—will start again without first cleaning cylinder—lighter of draft—no danger tires or wheels coming off—no checking of hubs or spokes. One of the most satisfactory machines ever on farm"—G. G. Fullerton, Dayton, Wn.

The name of R. M. Wade & Co. means a great deal to the old-time residents of the Oregon country—it stands for 44 years of honesty and reliability.

Old established—up-to-date

If your dealer can't supply you, write direct to

R. M. Wade & Co.
322 Hawthorne Ave., Portland, Ore.

A SHORT TREATISE ON THE WOOLLY APHIS

I think, probably, most fruit growers and nurserymen will agree that this is one of the most troublesome pests which they have to contend with, and therefore our readers will be interested in anything relating to it.

Something has been done in the way of combating the plague, in the antipodes and also in America, by working apples upon stocks such as Northern Spy and Winter Majetin, which they say are proof against American blight; and I thought years ago of trying the effect of these stocks in England; but when I went down to Chiswick and found the old tree of Northern Spy covered with woolly aphis, I concluded that it would be a waste of time and money to import stocks of this variety for working, and had to look around for something better.

Of course we know that this insect prefers one variety of apple to another, and whilst Cox's Orange, Blenheim and others may be white over, you will rarely if ever find a trace on Duchess of Oldenburg, growing alongside; still I think this is only a question of preference, and I don't believe one would be free from the pest if one grew Duchess of Oldenburg only, that is, upon land previously infested by the blight, for I have occasionally seen it upon trees of this variety; if there were no other hosts I think it would increase upon this.

It would be vain to tell of all the remedies which have been tried in order to get rid of Schizoneura lanigera. I think I have tested most of them; paraffin is useful but very dangerous, and I believe always injures the trees to a greater or lesser extent; methylated spirits, in the hands of a persevering amateur, is a certain cure, but if his neighbor restocks his trees it is a heart-breaking job to recommence, and of course it is out of the question to tackle large standards with a camel's hair brush and drop of spirit. Whale oil is useful, but, alas! it is neither pleasant to use nor nice to look upon, and so we go on through the list.

I would not have written thus far if I had only failures to chronicle, but I think I may say that at last I have met with success. I tried some nicotine for apple sucker, and noticed that some patches of American blight on the stems of some standard apples turned a yellowish color, lost all its fluffy appearance and decayed away; so I bought a lot more nicotine and sprayed some bush trees, but failed to see the least result, although used in exactly the same way. A second spraying did a little good, but was by no means satisfactory, so we tried a mixture stronger, with the most happy result, it kills every bit of American blight.

The remedy is prepared by Walter Voss & Co., Milwall, London, E., and is called Woburn tobacco extract.

I use a pint of this to twelve gallons of water, and I dissolve three pounds of best soft soap and mix in a paraffin cask full of water. The cask holds about thirty-six gallons, and thus three pounds of soap and three pints of nicotine are required. I find the soap helps to keep the nicotine on the trees.

I suppose it is a confession of weakness to admit that one could find American blight in one's nursery to experiment upon, but I feel sure that such will not be the case next season. When I wrote some five years ago, telling how black currant mite could be destroyed, most people thought the remedy was too cheap and simple, and others gave us credit for having a stock of mite on hand, and so would not buy trees; but things came round in time, and although one still sees in the "Answers to Correspondents" column of the horticultural papers, remarks to the effect that no remedy is known for the currant mite, many growers have thanked me for helping them to clear their plantations. The present remedy may take on better, for it certainly does not err on the side of cheapness. As we all know, American blight hibernates on the roots of the trees, so one must not neglect it during the winter. One of the winter washes will be useful to cleanse the branches and stems of any apples suffering. I have used Cooper's V. I. fluid with good effect. February is the best time to apply this, and a good dressing of soot upon the surface of the soil is most beneficial. A dusting of sulphate of ammonia will also destroy the underground aphis, and if you can get gas water, such as the gas men pump out of the mains, it is fatal to American blight, if watered into the soil.

I have no interest in any of the things named in this paper, but simply speak of them as I have found them, for the common good of all interested in fruit or fruit tree culture.—A. H. Pearson, Lowdham, England.

The Prize Winners

At the National Apple Show held at Spokane all used

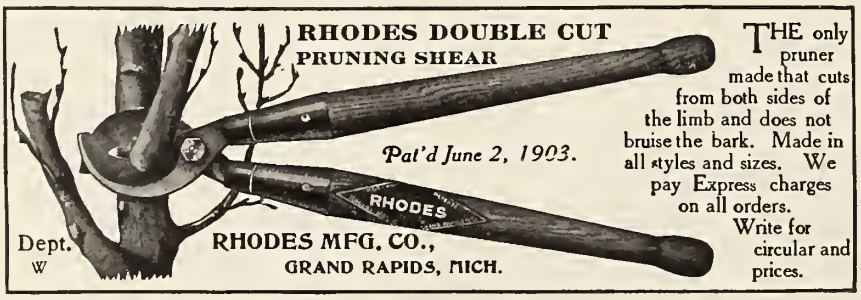
Pearson
Cement Coated Wire Nails

In their packing boxes

They Know! Do You?

Manufactured only by
J. C. PEARSON CO.
Boston, Massachusetts

A. C. RULOFSON CO.
Pacific Coast Sales Agents
Monadnock Bldg. San Francisco



THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.

Stanley-Smith Lumber Co.

WHOLESALE AND RETAIL
LUMBER
Lath, Shingles, Wood, Etc.

Hood River, Oregon

R. E. HARBISON — *Strawberry Crates* — A. L. NEWTON

WE MAKE THEM OF EVERY DESCRIPTION **BOXES** MADE OF ODORLESS WHITE FIR

The kind that helped to make Hood River famous. Used by the best trade. Write for prices

We make Hood River Apple Box Press, the best on the market

HOOD RIVER BOX CO.
Formerly owned by the Davidson Fruit Company HOOD RIVER, OREGON

The Hood River Electric Light, Power & Water Co.

DOING A GENERAL ELECTRIC LIGHT AND POWER BUSINESS

TWENTY-FOUR HOUR SERVICE

City Water Works System for Domestic and Municipal Use. Are prepared to furnish 3,000 horsepower, either Electric or Water, at Reasonable Rates

General Office, HOOD RIVER, OREGON

PINE BOXES

BRIGHT, LIGHT FRUIT BOXES FROM THE FAMOUS KLICKITAT PINE

Our new plant can fill your orders promptly and satisfactorily and save you money. Send your specifications and ask for prices

Klickitat Pine Lumber Co.

Portland Office: 26 Concord Building GOLDENDALE, WASH.

ORGANIZATION AND CO-OPERATION OF FARMERS

By F. S. Cooley of Bozeman, Montana

The Farmers' Institute programs in Montana arranged by Professor F. S. Cooley for May and June emphasized farmers' organization for the exchange of ideas and experiences, the development of social life of the farmer and his family, the promotion of confidence among neighbors and co-operation in business matters.

The Grange, with three million members and strong organizations in almost every Northern state, is not at present in Montana or one or two other adjoining states. A year ago Idaho began Grange organization, and South Dakota has effected a beginning during the last few weeks.

The following abstract from National Grange Circular No. 6 explains the purpose of the Grange in part:

"A Factor of Society—Every man is a factor of society, and as such he is accountable for the manner in which he performs the duties which devolve upon him.

"His Moral Duties—The first is to his home and family. The second to his government that permits him to enjoy the blessings and happiness of his home and family. The third is to better the conditions and advance the interests of his chosen occupation.

"Since we are looking at the farmer's side of the question, what should be his action and what can he do to better his condition?

"Helpless as an Individual—There are certain conditions existing which must be met and overcome to obtain results desired by the farmer. What legislation is needed must be secured by his combined efforts. As an individual among seventy millions of people he is infinitesimally small, and as an individual he is hopelessly helpless to do one thing to obtain relief.

"The moment the farmer attempts to relieve any burden created by unjust taxation or unequal distribution of it, it makes no difference in what direction, he is met by an organized force. No argument is needed at this time to convince any intelligent farmer that such is the case.

"It is not enough that he complains and wants something done, but he is morally bound to do something himself and not merely wish it done.

"He Has Power—He has power and it is his duty to use that power so as to make it available and his influence felt. So that if he cannot make his influence felt or his power available as an individual (and I say he cannot), his duty is to make it so, and that can only be done through his organized efforts.

"His Political Duties—Every farmer owes it to society to assist in securing honest legislators and just representation. That a lethargy exists among farmers in regard to political duties is evident from the class of legislators that represent them, composed as it is almost wholly of men from other professions and possessing but little interest in the affairs of the farmer.

"Confidence Needed—The farmer has submitted so long to the powers that be that in many places he has lost confidence in his ability to do anything, and above all needs the stimulating influence of a farm organization to awaken his energies and give him courage. To do the work assigned to him as a citizen he needs an understanding of the questions of the day; he needs a preparation that will enable him to act in the management of the affairs of his time. In short, he must be able to stand up and defend his interests whenever it is required, and this ability to think quickly and act courageously only comes from a drill obtained in organization, and a farm organization teaches him to have confidence in his fellow farmers and

The EDGEMONT APPLE BOX LID PRESS

A Bitter Root Valley Product

Invented by W. B. Harlan and A. V. Platt *Patent Pending*

A GOOD, PRACTICAL AND SATISFACTORY PRESS

The latest improved invention of *orchard* men, built and used by them in their *own* packing houses.
This press handles *standard* and *special* boxes without change.
It has a *strip-holder* to place strips where they are used on lids.
It has *clamps* to hold the lids, that are not in the way while nailing.
It has a *stripper nail box* that gives you the nails, all points down, within easy reach. This is used by many in making up their boxes, and is alone worth half the cost of the press.
It has *brackets* to hold the *bunch of lids* at the top of the box.
It has ample *leverage* to draw the lids down to nailing position easily.
It is simple, strong, compact, and, best of all, the price, *$10 f. o. b. Hamilton, Montana,* is within the reach of every fruit grower. Freight to Bitter Root points, 25 to 50 cents. Weight, knocked down and crated for outside shipment, 50 pounds.

MANUFACTURED BY

H. PLATT & SONS, Como, Montana

Allen Fruit Caliper

Sizes fruit accurately and rapidly, and enables the practical grower to put up the commercial pack for the fancy trade. Live agents wanted in every fruit district throughout the world.

CORRESPONDENCE SOLICITED

ALLEN & ERFERT

Missoula, Montana

THE COLORADO NATIONAL

APPLE EXPOSITION

Denver Auditorium

January 3 to 8, 1910

Invites the

Northwest Apple Growers

To exhibit at, and attend the event

BIG PREMIUM LIST
AND COMPETITION OPEN
TO THE WORLD

For further information address

CLINTON L. OLIVER, Secretary

1725 Stout Street Denver, Colorado

acquaints him with the vital questions affecting his interests.

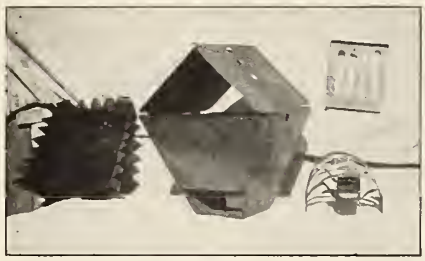
"Created a Social Being—The farmer was created a social being and needs the wholesome influence of organization to keep him so. His business is comparatively one of isolation, varying in degree according to his environments. The farmer who lives within the boundaries of 160 acres becomes very narrow and is of little use to his community. His family is correspondingly dwarfed as they are shut out of society, and are improved as their opportunity for association increases. The individual excluded from society will, in time, lose his mental powers and become oblivious to his own needs as well as to the needs of others. Here again he needs a farm organization where he, with his family, can meet with freedom and ease, and while cultivating sociability can secure mental culture and pleasing manners—something that too many famers' homes have neglected.

"The Grange the Best—Without further arguments all agree that the farmer needs to organize, and without any hesitation we say the Grange is his best organization. Its declaration of purposes is as fine a document as we have ever seen written by man. Its application to farm life and fine sentiment contained cannot be surpassed. With its thirty-two years of existence, in which time it has met the surveillance of every opposition, it has not been found wanting in any particular. It has stood the test, while many other organizations which have sought to improve upon it have met with disaster and ruin. The plan of the Grange is right in being made co-existent with the needs of the farmer, having an organization in the township, county, state and nation, whereby it is able to serve him in every sphere. Anything short of this is deficient.

"In essentials unity; in non-essentials liberty, and in all things charity."

The Grange recognizes and helps the farmer's wife. It encourages the boys and girls. It promotes education and better highways. It teaches the highest morals and man's relationship to his Maker. It inculcates better business. It has secured the best legislation for the farmer, both state and national. It makes stronger and purer and better men and women.

I should like to get into communication with every farmer who will help to organize a Grange in Montana. Concert of effort is much needed to bring success.



Buehring's Perfect Orchard Heater

Will save your fruit crop from Jack Frost. Used with absolute success last spring. For a limited time I will offer this combination coal and oil heater, fully protected by letters patent of June 8, 1909, for sale, state rights or entire patent. For particulars address

Frank Buehring, Grand Junct'n, Colo.

LECTURES TO BE GIVEN AT FRUIT SCHOOLS

Stevensville and Hamilton, January 10-15, 1910

Four hours' instruction daily in fruit growing and allied subjects. One popular lecture each evening. Among the instructors of the schools are:

Professor O. B. Whipple, horticulturist Montana Agricultural College and Experiment Station (four lectures): "Pruning Mature Trees," "Pruning Young Trees," "Factors in a Good Fruit Section," "Frost Protection."

Professor M. L. Dean, horticultural inspector-at-large for the State of Montana (four lectures): "Varieties to Plant," "Fruit Judging," "Small Fruits," "Propagation and Top Working."

Professor R. W. Fisher, horticulturist for the Bitter Root Valley Ditch Company (four lectures): "Planning and Planting the Orchard," "Cultivation and Irrigation," "Picking and Packing the Fruit," "Crops for the Young Orchard."

Professor Alfred Atkinson, agronomist Montana Agricultural College and Experiment Station (six lectures): "Origin, Formation and Classification of Soils," "Soil Cultivation," "Irrigation in Relation to Plants," "Maintenance of Soil Fertility," "Crop Rotation," "Use and Value of Farmyard Manure."

Director Frederick B. Linfield of the Montana Experiment Station (two lectures): "Animal Feeding," "Forage Crops."

Professor R. A. Cooley, entomologist and biologist Montana Agricultural College and Experiment Station (two lectures): "Insects in Relation to Fruit Culture," "Spraying and Insect Control."

Professor Deane B. Swingle, botanist and bacteriologist Montana Agricultural College and Experiment Station (two lectures): "Bacteria in Relation to Fruit Growing," "Control of Fruit Diseases."

F. S. Cooley, superintendent farmers' institutes.

The following have been secured for evening lectures: Professor M. J. Elrod, Montana University, "The Glacier National Park"; President Henry R. Fancher, Montana College, Deer Lodge, "Over the Sea to Italy"; Professor R. G. Young, superintendent Butte Public Schools, "Industrial Training"; President James M. Hamilton, Montana Agricultural College, "Luther Burbank"; Mrs. D. E. Bandaman, Shakespearian recital, assisted by musical talent; and if possible Mr. E. H. Shepard, editor of "Better Fruit," Hood River, Oregon.

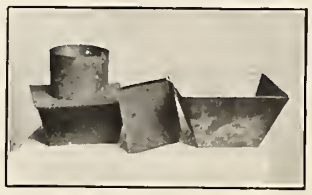
THE NATIONAL ORCHARD HEATER COMPANY

Incorporated

This Heater saved $3,000,000 worth of fruit in Grand Valley

And now we want to say, Mr. Fruit Grower, prepare to fight the frost. It has come; it will come again. Make up your mind what you want, whether it is sawdust, coal or oil, and buy it. Don't wait until the last minute and run into town and kick because it is not lying there ready for you. You can rest assured that these Orchard Heaters will not be carried in stock by dealers like cigars or coffee.

We will say this: We are willing to put the NATIONAL down by the side of any Orchard Heater made, either coal or oil, for a pull of from five to eight hours. A little test of from two to three hours is not a demonstration of the merits of any heater; it simply demonstrates the fact that you have a pot you can burn oil in.



We also manufacture the National Coal Orchard Heater

Write for information

Offices 131 South Sixth Street, GRAND JUNCTION, COLORADO

Hamilton Reservoir Orchard Heater

The only heater known that combines simply and perfectly the THREE VITAL FEATURES that make for the most successful and economical outdoor heating.

NOTICE THIS

A simple and positive regulation of the fire by simply drawing the cover. This gives a flow of heat just according to the temperature requirements of the night, and the consumption of oil just in proportion to the amount of fire used. This is the only sensible and economical principle and makes it a small consumer of oil. It couldn't be otherwise. Secondly, A reservoir of oil *not under fire* which admits of an all-night burn with positively no attention required after lighting. This feature makes a uniform fire throughout the period of burning and saves labor as none others can. Thirdly, It gives just the proper combustion for most successful *outdoor* heating. Rochester lamps and oil stoves are intended for indoor heating, and *orchard heaters* have to work under very different conditions. Look into this thoroughly and don't be deceived. It is the simplest in construction, the easiest to operate, and positively the most effective heater known, and these features have all been proven and tried thoroughly in this valley last spring, when more fruit was saved from the frost per heater than any other devices used. We can show you. Draw the cover and the fire does the rest.

Write us for information

HAMILTON RESERVOIR ORCHARD HEATER CO.

Grand Junction, Colorado

FROST IS VANQUISHED

and the Troutman Orchard Heater is the Victor

Orchard heating; the greatest insurance agency on earth. The Troutman Heater; the cheapest and most reliable policy ever offered.

Your fruit is protected by science—The Troutman Heater is scientific. It burns oxygen with the fuel, by means of the center draft, and by so doing creates a greater amount of heat for the same quantity of fuel consumed.

USED FROM COAST TO COAST

Write us for prices and full information
Our statements are subject to affidavit

ADDRESS

THE ROUND CREST ORCHARD HEATER CO.

CANON CITY, COLORADO

HEATING OF ORCHARDS

By J. R. Wentworth of Grand Junction, Colorado

Artificial heat for the protection of orchards from frost in the spring is no longer an experiment. For many years fruit growers throughout the fruit districts in the West have been endeavoring to protect their orchards during the period of blossoming by the means of smudging, using straw, manure, hay and trash of any kind that would make smoke. This method did not prove successful and the question of heat instead of smoke was tried by several energetic growers.

Two years ago J. C. Plank and T. E. Fulghum of Grand Junction, Colorado, the former a large fruit grower and the latter a practical mechanic who has patented several inventions, associated themselves for the purpose of producing a heating device that would solve this problem. After manufacturing and testing more than one hundred different styles of heaters, and also securing samples of heaters used in other districts, these gentlemen finally perfected a coal pot which they named the National Orchard Heater. Later an oil pot was produced, both of which have proved to be what has really been needed to fill this required want.

In order to test the pots manufactured by themselves and also to obtain a knowledge of the merits of other heaters, numerous experiments and demonstrations were made, both under canvas and in the open air, using various numbers of heaters to the acre until the number necessary to raise the temperature sufficiently to protect from frost was ascertained. Three different sizes were made for the use of coal, the smaller heaters being used in larger numbers and the larger ones proportionately.

There are three important factors in orchard heaters. First, a heater that will protect the orchard from frost under any and all conditions; second, one that will accomplish the purpose with the least amount of fuel, and third, one that can be operated with the least amount of labor.

The latter requirement is one of the most important, as during the frost period, every grower being engaged in the same work, labor is scarce, and when the alarm is sounded there is no time to be lost.

The labor problem in the large orchards where thousands of heaters are used is a serious one, and taking into consideration that heaters after being used at night must be refilled during the day for use the next night if needed, the work connected with this task is considerable. The heater, therefore, that can be refilled and then operated with the least amount of labor, and still accomplish results, is the heater that will find favor with the fruit men.

the heater, to be satisfactory, must be constructed in such manner that no delay shall occur in get-

After experimenting with coal heaters, work was commenced by this company on one that would burn crude oil and give the desired result. After many tests a heater was produced that was found to be far ahead of any previous oil burning pot. The secret of this heater was in the burner, which was immediately patented, and has been found to be the realization of what the inventors were after.

The oil heater made by the National Orchard Heater Company has proven under test to be far superior for many reasons.

First, it is constructed on scientific principles, does not burn directly from the oil, as the burner is so made as to generate gas, and burns not only oil but a great per cent of oxygen. Second, it can be regulated so that different degrees of heat can be produced, as conditions may require, and third, that while it can be operated with much less labor it can be placed in the orchard and filled ready for use, without any fear of having its contents ruined by rain or snow, it being fully protected with a water-tight cover.

One can readily understand that quick lighting of heaters is of the utmost importance, when temperature is falling below the danger point, hence

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Hose, Nozzles, First-class Plumbing Supplies
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Successor to Norton & Smith
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Eliminates usual gasoline engine troubles. Write for complete descriptive catalogue, which explains in detail the many superior features
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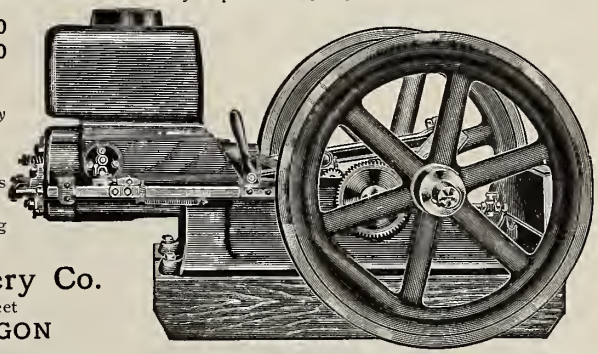

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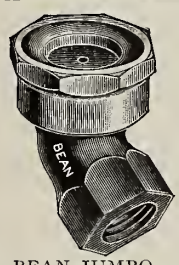
BEAN SPRAY PUMP COMPANY
SAN JOSE, CAL. CLEVELAND, OHIO.
Please N B (ee) (take notice) that B(ee)N means BEAN, and remember that for 25 years it has been true that
THE BEAN IS THE BEST in



BEAN JUMBO ANGLE NOZZLE
Our latest
Everything for Spraying
BEAN GIANT POWER SPRAYER
Has largest capacity, three lengths of stroke, is perfectly machined, has our patent ball valves with removable seats.
BEAN CHALLENGE POWER SPRAYER
FINEST EQUIPMENT, MOST PERFECT SPRAYER BUILT
Is a medium capacity, low priced, durable outfit; has only one cylinder, two valves, and is simplicity itself; has two-horsepower engine, quickly removed if wanted for other work.
BEAN MAGIC HAND POWER SPRAYERS
Run a third easier than any other spray pumps made. They are "BUG" KILLERS—not MAN KILLERS. Two very important new improvements this year.
Aluminum Spray Rods
Spray Nozzles (16 kinds)
Special Hose Fixtures
Brass Spray Extras of all kinds
Ortho Arsenate of Lead
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"Bug-Go" Emulsion for prune trees
All kinds of spray materials
Bean Spray Hose (the very best)
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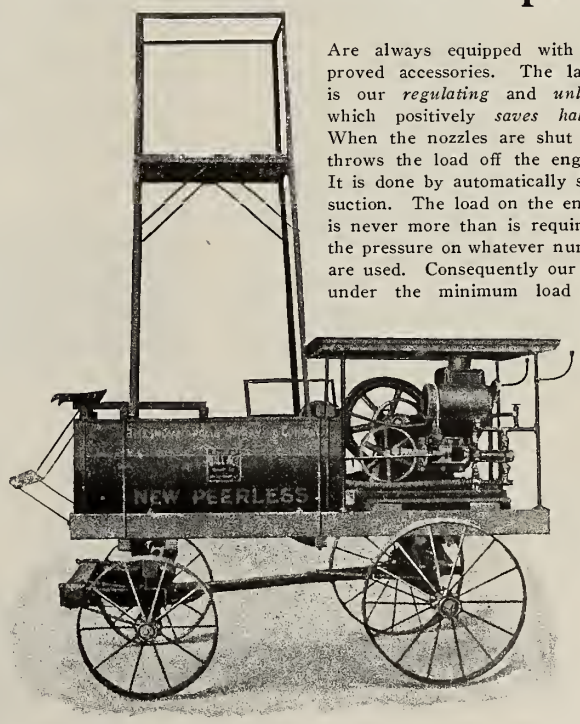
Spraying Outfits for every purpose
We are always pleased to quote prices, send catalogues and answer inquiries.
BEAN SPRAY PUMP CO.
213 West Julian Street SAN JOSE, CALIFORNIA

American Power Sprayers
Are always equipped with the most improved accessories. The latest thing out is our *regulating* and *unloading device*, which positively *saves half the power*. When the nozzles are shut off this device throws the load off the engine and pump. It is done by automatically shutting off the suction. The load on the engine and pump is never more than is required to maintain the pressure on whatever number of nozzles are used. Consequently our machines work under the minimum load all the time, instead of under the maximum load, as others do.



New Peerless Mounted
Our New Peerless Sprayer shown above was the wonder of the National Apple Show, Spokane. It maintained a constant pressure of 200 to 220 pounds with less than half the usual power. Better get informed about this. The device is applicable to all kinds of sprayers.
AMERICAN SPRAYER CO.
Minneapolis, Minnesota

the heater, to be satisfactory, must be constructed in such manner that no delay shall occur in getting ready to light. The National Orchard Oil Heater is ready to light at all times and without delay. There is another matter that should be taken into consideration and that is the fact that crude oil that has been burned from several times is not so quick to light as fresh oil, and large heaters holding enough oil for several nights' burning are not as satisfactory as smaller ones requiring partial refilling after each burning.

In comparing the merits of oil and coal as fuel for orchard heating the question of labor should be kept in mind, inasmuch as less labor is required to handle oil than coal, and while either will do the work required at approximately the same cost for fuel, the oil heater, requiring less labor, will undoubtedly be given preference for use in larger orchards.

As stated in the beginning of this article, artificial heat for protecting orchards from frost is no longer an experiment, as the results obtained the past season prove conclusively that orchard heating is a success. This being true, it follows that in sections where frosts sometimes occur, even though but seldom, the fruit growers should provide themselves with the means of protecting their crops. Money spent for this purpose is the same as money paid for fire insurance, and every good business man figures money spent for insurance is money well spent.

The testimonials received from fruit growers who have used the National Orchard Heaters and also other styles justify the claim of this company that their heaters are superior to any other style ever placed on the market.

If you are interested, write to the National Orchard Heater Company, Grand Junction, Colorado, for testimonials, descriptive circulars and other matter pertaining to orchard heating, and same will be promptly furnished.

D. McDONALD
Hood River, Oregon
Headquarters for
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TOOLS
Disc Harrow Extension for Orchard Cultivation a Specialty
When you want any kind of Orchard Tools come to me and get the Best

MARVIN'S GASOLINE AIR COMPRESSOR
SPRAYER
To be used in connection with steel tank instead of gas. Cost of operation about fifty cents per day for gasoline and oil. Gasoline Engine and Air Compressor on same base; weight only about 350 pounds.
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Have you a water problem to solve? Why not look into the matter and see what one of these engines will do for you?

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First—In hundreds of cases they avoid the necessity of going away up-stream and building long, expensive ditches.
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The I. H. C. line includes an engine for every section and every problem—all sizes for all farm uses—vertical, horizontal—both stationary and portable; engines on skids; sawing, pumping and spraying outfits. Also I. H. C. gasoline tractors—first-prize-gold-medal winners—the best all-'round farm tractor by test.

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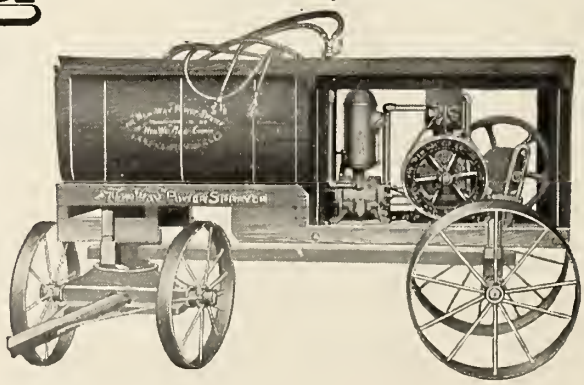
THE "New-Way" POWER SPRAYER
Always ready for any work in any climate
Easily detached
IS EQUIPPED WITH THE FAMOUS
"NEW WAY" AIR COOLED ENGINE
Gasoline, Distillate or Alcohol Fuel
Carries high pressure without the usual vibration or strain, and is the most practical, durable and economical machine ever built for spraying. Use your own running gear if you prefer. Write us today for Spray Catalogue No. S-8



Fruits of High Quality Follow this Quality Sprayer

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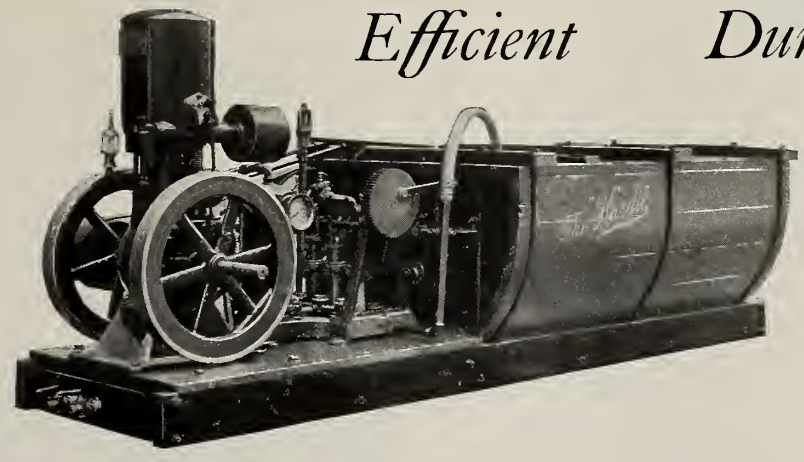
The Hardie Triplex Sprayer

Efficient *Durable* *Simple*

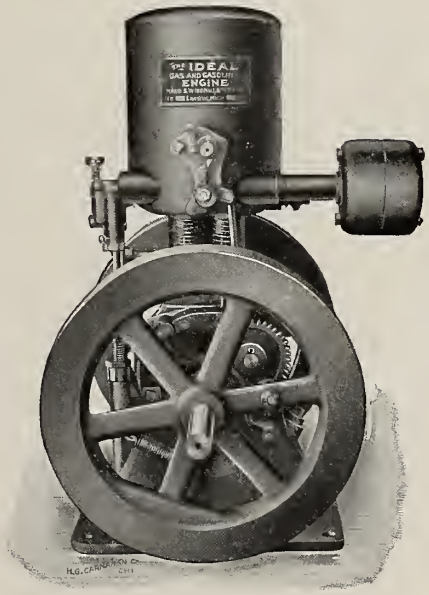


NOTHING TO WATCH BUT THE SPRAY

OUR 1910 model Triplex will suit you; will suit you in efficiency, in simplicity, in pressure, in capacity and in general makeup. Our TRIPLEX PUMP gives you an even continuous pressure, be it high or low, as desired. Our Rotary Agitator gives thorough agitation and our Ideal Engine sufficient power.

On all Hardie Power Sprayers we use Our

IDEAL ENGINE



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Our complete catalogue giving prices of twenty different styles of hand and power sprayers, engines, nozzles, etc., is yours for the asking

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IN THE

Yakima Valley

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The following statements of crops raised in 1907 show the incomes that are derived:

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J. H. Forman raised $3,000 worth of pears on three-quarters of one acre.
Mrs. W. L. Wright raised $13,000 worth of apples on 8 acres.

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We have hundreds of prospering ranches.
We have the oldest orchards in the state.
We have the earliest strawberries in the state, year after year.
We have a climate that is right, and gardens grow nearly all winter.
We have the noted Blalock fruit farm of 1,500 acres.
We have the famous Dumas orchard of 100 acres, which has produced 69,000 boxes of high grade apples during the past two seasons.

We have the soil, and the water in abundance, and our valley has been making good, as a place to farm and a place to live, for the past fifty years—yes, we emphasize that latter point, for it is of more importance than is sometimes understood. WALLA WALLA VALLEY IS A GOOD PLACE TO LIVE, for here agriculture goes hand in hand with a long established "civilization." In fact, the chief city of the valley, in addition to offering every ordinary convenience and benefit, is the home of the famous Whitman College, now accumulating an endowment of $2,000,000, and ready today, with the scores of other schools throughout the valley, to welcome your children to opportunities equal to those of the East.

ASK QUESTIONS

Commercial Club, Walla Walla, Wash.

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The natural home of Newtown and Spitzenberg apples

Apple Land

Good, Better, Best, at Prices Lower than Less Valuable Land in Other Localities

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Further information gladly furnished by

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MOSIER, OREGON

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APPLES AND STRAWBERRIES

That's all

The World Knows the Rest

The fruit growers had $36,000 in the bank in 1901. Today the three banks carry $1,000,000.

Fruit pays from $500 to $1800 per acre and is all sold at the highest prices while still on the trees.

We have 40,000 acres left awaiting some one to come to help us improve it. Do you want a chunk?

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BETTER FRUIT, Hood River, Oregon

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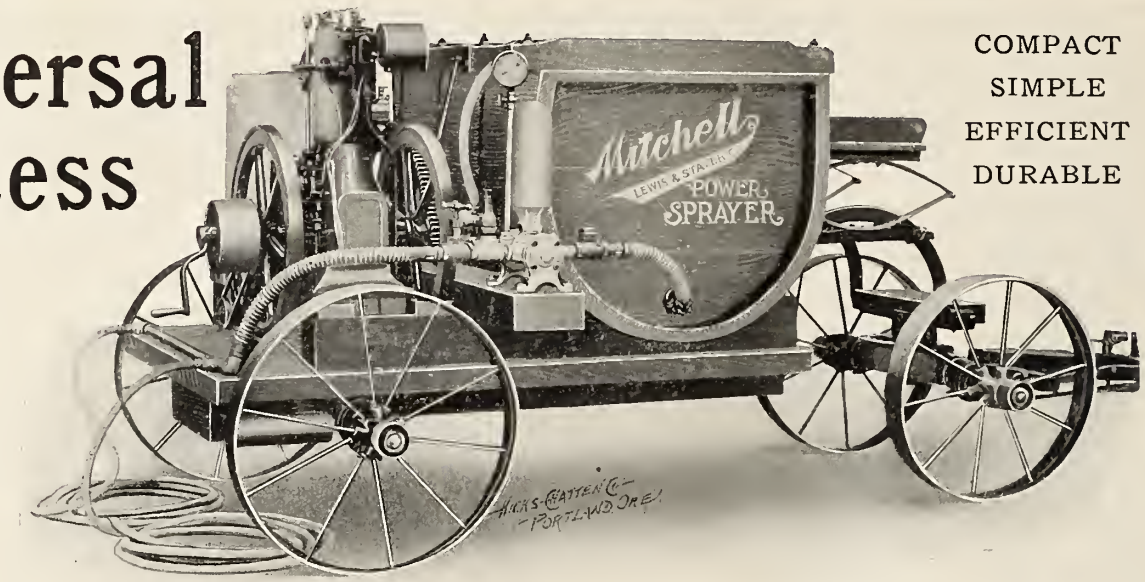

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